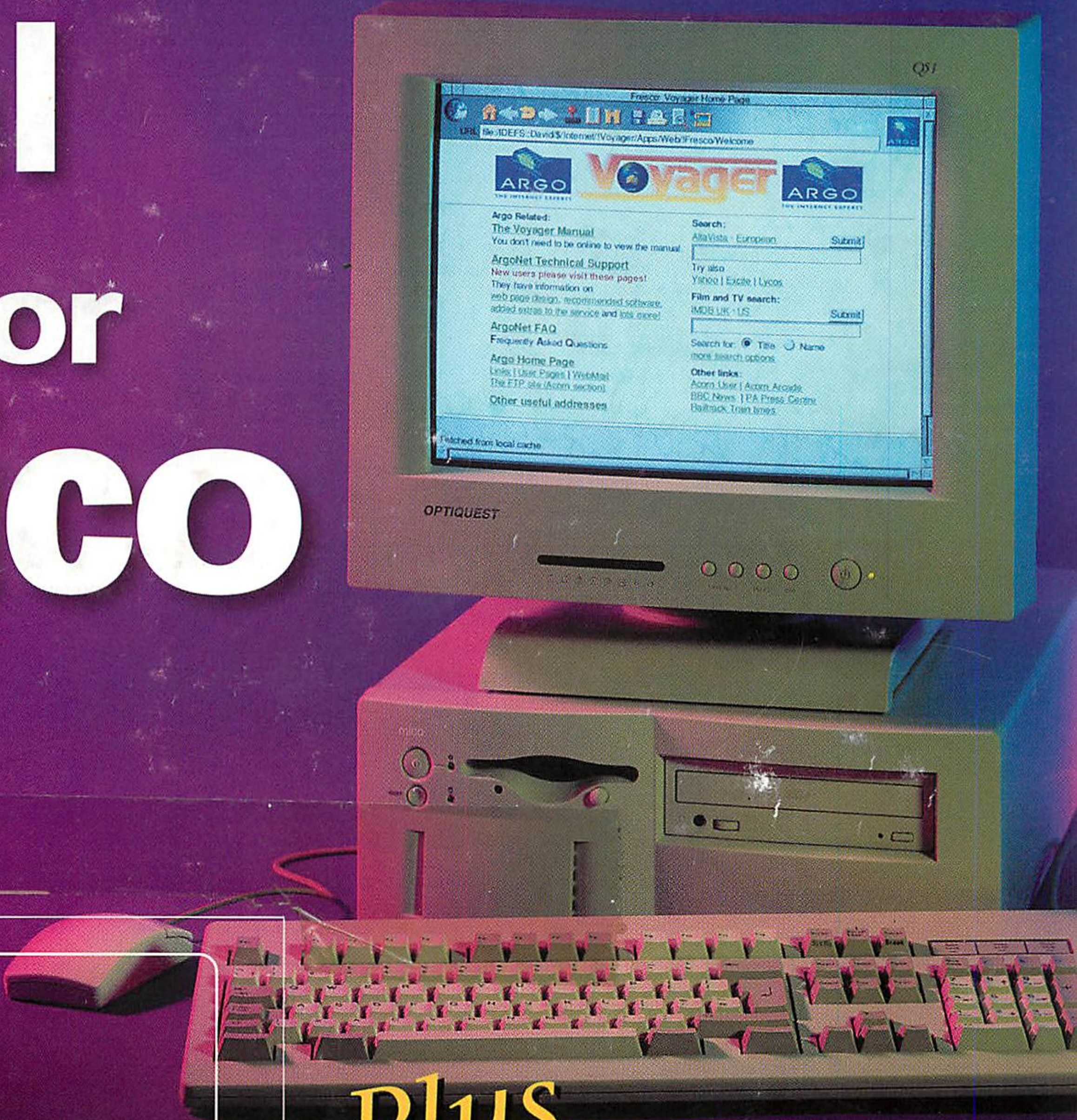
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JULY 1999

Features

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Next month

Exclusive news of what's happening at RiscStation Ltd, an AAUG report, creating a home network plus all our ongoing series'

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StrongARM differences

The good news is that Intel, which now owns the rights to the StrongARM family of RISC processors, has announced details of StrongARM version 2 – or SA-2. It will run at up to 600MHz, deliver 750 mips of processing power and still consume less than half a watt of power.

The bad news is that Intel could effectively divorce itself from the collective ARM family by introducing its own extensions to the ARM instruction set. At a recent semiconductor technology event a senior member of Intel's StrongARM design team refused to deny the rumours of new proprietary instructions in SA-2.

ARM Ltd usually makes a cast-iron condition of any licensing of the ARM platform that licensees don't tamper with the instruction set. Digital Semiconductor, who originally licensed ARM's architecture to produce SA-1, extensively modified the ancillaries within the core to enable it to be reliably clocked at higher rates than had been previously possible, however, they dutifully stuck to the basic ARM instruction set in order to ensure it remained software compatible.

Intel is not averse to adding new instructions to its products. After all, the current Pentium family of PC processors is still religiously based on the very first Intel 8088 PC processor first developed nearly twenty years ago. Pentiums now cater for hundreds of additional instructions compared with the original 8088, yet retain almost total backwards compatibility with the old chip.

If Intel remains true to form and manages to add new StrongARM instructions without compromising the original ones, any damage may be limited to relations with ARM Ltd. The concern is that any Intel-inspired instruction set changes could unavoidably affect software compatibility, and StrongARM could be headed further away from its origins should ARM choose to add its own instruction set enhancements at some time in the future.

Peering through the spectacles of rash speculation, RISC OS might one day be faced with a stark choice to either go down the StrongARM route or the ARM Ltd path.

Nevertheless, the promise of a 600MHz StrongARM is accentuated by news that the chip's internals are getting the once-over as well. A new 7-stage integer pipeline and 8-stage memory pipeline, combined with smarter dynamic branch prediction promise to hurry data throughputs along, which could translate into an overall performance improvement greater than the clock speed multiplication implies.

The fastest current releases of Intel's Pentium II processor family for desktop PCs are clocked at 550MHz, so a 600MHz StrongARM sounds great. However, SA-2 won't start shipping until around this time next year.

Nevertheless, if SA-2 lives up to the hype and can be successfully introduced to the RISC OS platform, it should more than triple the CPU power currently enjoyed by Risc PC users and still not require a heat sink on the chip.

Power consumption, or the lack of it, looks like being excellent as usual and the prospect of PDAs, mobile phones and other portable battery-powered devices equipped with SA-2 using up to 600MHz of StrongARM power could be very impressive.

RiscStation News

Following their successful launch at the Wakefield show RiscStation have decided to increase the initial production run of their R7500 to cope with demand. Full production is still on target for late July with developers machines shipping slightly earlier.

The company will be visiting foreign shores and displaying multiple hardware products at the Big Ben Show in Holland, including currently unannounced hardware and software – exclusive news on that next month.

RiscStation have also announced that as of May RiscStation Australia Ltd will be assembling and distributing their equipment to customers down-under. Mal McClenaghan of The Image Factory will head this new venture (see The Regan Files, page 74, for more info).

Their press release states 'We anticipate that this will enable us to satisfy market demand and to develop our RISC technology even further, allowing us to expand the RISC OS market.

'This will allow software developers to expand their projects, and consequently benefit users, with the best software and technology combined.' Resellers and software developers who wish to know more should contact Kathy Cartmell on +44 (0)1942 79 77 77 RiscStation Ltd, or Mal McClenaghan on +61(0)3 9458 3599 RiscStation Australia Ltd.

RiscStation: e-mail: info@riscstation.co.uk or Web: www.riscstation.co.uk

RiscStation
RISC Based Technologies

S-Base Returns

S-Base, the programmable database package for RISC OS has returned from obscurity. Originally marketed and supported by Longman Logotron, the package has been without a patron for several years. Now new Acorn developer, Bluewater Systems Ltd based in Christchurch, New Zealand, is re-releasing *S-Base* in a revised form.

A new *S-Base* Personal Online Edition is now available for £29, though it seems that if you want to try it out you have to pay the price and re-claim it, if you decide not to keep using it after the month is up. A new *S-Base* Web site has been set up, and there is also a discussion group for keeping up with events and swapping ideas with other users.

Several bug-fix releases have already been made and upgrades are available for download from the *S-Base* Web site. Online documentation and example applications are also available.

The *S-Base* Web site is www.bluewaternz.com/s-base, e-mail: s-base@ bluewaternz.com, Bluewater Systems Ltd, 10 Royalist Ave, Christchurch, New Zealand

Acorn PLC

As these words are written in the middle of May, Acorn PLC still exists, and its shares continue to be traded in the stock market. In fact the price is 255p, near to its high for the year, but in truth we are witnessing the end of Acorn as we know it. Almost a month ago just after June's *Acorn User* had been finished, news came through that the Acorn Computer Group was finally being broken up

Acorn will, with some justification, be regarded in the history books as the last British desktop computer company to both design and manufacture its own hardware and operating system. Only Psion can now claim to be the UK's remaining combined operating system and computer maker, its products, of course, being of the pocket computer variety.

What has happened to Acorn is quite complicated, but it goes like this: Acorn has been bought by an off-shore subsidiary of the US investment bank, Morgan Stanley. The aim is break up the company in order to release Acorn's £300 million shareholding in ARM Ltd. Acorn has been stuck with the shares, unable to cash them in without incurring a massive tax bill.

Some creative accounting courtesy of Morgan Stanley appears to have provided the solution, with Morgan Stanley using the purchase as a tax loss and swapping Acorn investors' shares for ARM shares. The deal also leaves Morgan Stanley ultimately sitting pretty with a large chunk of ARM shares worth around £40 million.

While the huge majority of Acorn's paper worth was its historical quarter share in ARM Ltd, there were two remaining parts of Acorn which needed to find new owners. Pace Micro Technology, who are best known for making satellite TV decoder boxes, have acquired Acorn's thin client computing and traditional personal computer products business, including around 30 staff.

The deal was worth just £200,000 – for Pace, almost a nominal amount. It's this part of the Acorn business which retains the rights to RISC OS and, hence, the licensing deal with RISCOS Ltd which guarantees the future of RISC OS, post-Acorn.

According to Paul Middleton, managing director of RISCOS Ltd, the corporate drama of Acorn's final dismemberment should, in reality, affect RISCOS Ltd minimally, and business is continuing as usual. It's a similar message with regard to CTL, which has licences to distribute and manufacture Acorn-branded computers.

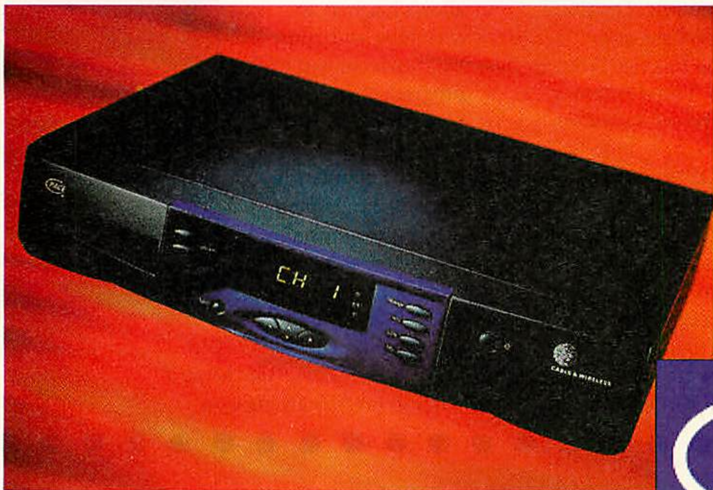
Elsewhere, Acorn's CEO, Stan Boland, is leading a management buy-out which will see the newly formed Element 14 division hived off as an independent company with the un-distracted aim of becoming established as a developer of programmable StrongARM-based chip-sets for digital TV hardware.

E14 has no future interest in RISC OS or any of the more traditional Acorn products and technologies which relate to desktop computing. Acorn's former HQ at Newmarket Road will not be vacated, and although E14 has a design team based near Bristol, it looks like they will share the Newmarket Road site with the staff who have transferred to Pace.

As both Pace and Acorn are listed in the stock market, procedures to approve the proposed arrangements between the two companies will not be completed until after this issue of *Acorn User* goes to press.

Ironically, as Acorn effectively disappears, the 'Acorn' computer market is showing determined signs of survival. Up to five independent companies are either already manufacturing RISC OS-compatible computers, or are making plans to do so.

RISCOS Ltd should, by the time this is printed, be on the verge of releasing its first product, RISC OS 4.0. However, nobody should be lulled into a false sense of security.



PACE

Parallel port networking

Stuart Tyrrell Developments (STD) officially launched *ParaFS*, a disc sharing software package, at the recent Wakefield show. *ParaFS*, which functions as a very simple network was developed by Soft Option and is distributed and supported by STD.

It offers transparent sharing of filing systems between RISC OS machines fitted with bi-directional parallel ports (including Acorn A5000, A30x0, A4000, A7000/+ and Risc PC machines). According to STD, tests show file transfer speeds in excess of 100K/sec with a variety of machines, sharing hard and floppy discs, RAM discs, CD drives and others.

As STD point out, this is approximately ten times faster than the highest speed of the Risc PC serial port, and over 50 times faster than the highest serial speed supported by RISC OS on A5000/A30x0 machines.

ParaFS is priced £22.95, or with a 'Red Hot' parallel port cable, £29.95, inc. P&P. Stuart Tyrrell Developments, on the Web: http://www.stdevel.demon.co.uk, tel: 01706 848 600.

Novel wireless Internet service for schools

For just £65 per month, schools are being offered a service which provides a permanent, or always on, 128 kilobit link to the Internet, unlimited usage and 5Mb of personal Web space for every student and teacher in that school. The package comes from Tele2, which launched its service to ordinary customers earlier this year.

The main difference is that schools are exempted from a data volume tariff during school hours, which would otherwise see heavy users having to pay extra should they exceed their monthly quota. Tele2 can undercut their more conventional rivals who offer ISDN and leased line services because they operate a wireless network.

Your site is fitted with a radio data receiver which communicates with a base station in your vicinity. A 384 kilobit service is also offered and faster connections will be available in the not too distant future.

Tele2 is based in Reading and their service is currently limited to the Thames Valley region, but they are rolling their network out with the target of covering 60 percent of the UK population by 2003. For more information, check out Tele2's Web site at http://www.tele2.co.uk

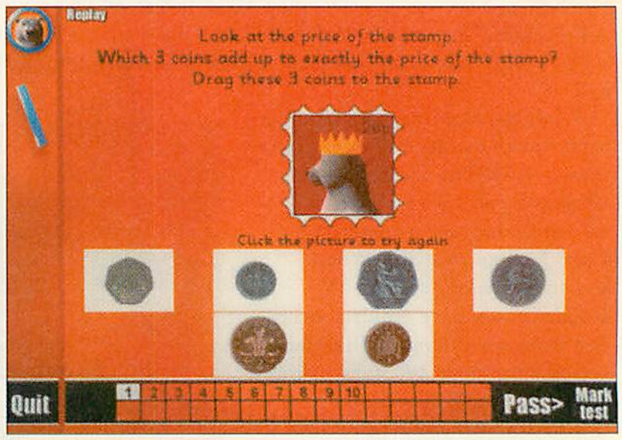
Practice makes perfect

Granada Learning, which owns the SEMERC education company, has released a new set of CD-ROMs for Acorn users which aim to help pupils improve their maths and science skills. The three CDs are called Practice Maths at 7, Practice Maths at 11 and Practice Science for National Tests at 11. Three different types of questions can be set, including multiple choice.

Results can be used to pinpoint areas of weakness requiring remedial tuition. More confident pupils can also use a self-test mode, with an option to beat the clock if required. There is plenty of multimedia content and the packages are designed to be fun to use.

The CDs themselves are backed up with teacher support materials. Practice Science for National Tests at 11 comes with a free copy of Odyssey Scrapbook, which allows teachers to customise and add their own content to a program.

Each CD is priced £45 + VAT for a 5-user licence, but individual students can obtain their own personal copies for the reduced price of £19.99 inc. VAT. Granada Learning, tel: 0161 827 2927, fax: 0161 827 2966, Web: http://www.granada-learning.com



New product from Granada Learning

ISDN Internet solution from Clares

If you aren't to keen on getting your hands too dirty messing around with server addresses, Internet protocol settings and dial-up configurations, but would like to get your Acorn connected to the Internet, Clares Micro Supplies have had some interesting comms packages based around the subscription free Dixons FreeServe Internet service.

FreeServe don't offer Acorn support for their service, but Clares provide a FreeServe-ready software package with their modems, including a £99 (Inc.VAT) internal modem and a £149 external v.90 voice/fax 3Com/USR modem.

Now Clares has added an ISDN terminal adapter (TA) to their range. Based on a Zyxel-manufactured external TA, this £199 package includes all the software you need to get connected to FreeServe. The TA has two analogue phone ports, so you can plug in at least two ordinary phones or fax machines. Also included is a voucher for free installation of an ISDN or BT Home Highway ISDN-compatible service.

Choosing the best option is a bit of a nightmare as BT offers several different ISDN packages. Clares' free installation offer comes from a third party company which charges more for the standing charge than BT, but slightly less for calls.

Plus there is a £49 special offer from BT on converting your existing phone line to Home Highway which could expire at the end of June, though BT has extended similar offers in the past. If in doubt, Clares say they will be happy to help customers choose the best package.

Alternatively, the Internet suite software and FreeServe support is available on its own, priced £49. Clares Micro Supplies, tel: 01606 833999, e-mail: sales@claresmicro.com

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Paragraphs can contain multiple graphics which can be left and right aligned with text flowing over them. Allows drop caps.

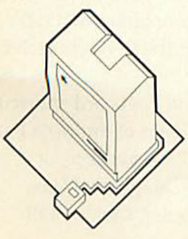
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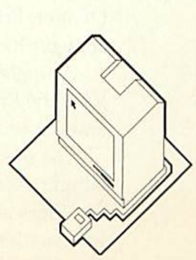
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Phone and Fax 01778 590563

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More Canon printer support

Spacetech has released new 'photo-real' and plain paper drivers for Canon's BJC2000 budget ink-jet printer. Similar to the BJC7100 drivers announced a month ago, the new drivers add certain features to RISC OS previously only available to Microsoft *Windows* users.

For the first time Spacetech has implemented dot modulation in a budget-priced Canon model. The BJC2000 isn't a true photo-real printer, and the only way to emulate a real system is to vary the size of ink droplets through modulation. Chris Hornby of Spacetech said: 'We have taken a bit of stick in the past about RISC OS drivers not being up to the standard of the *Windows* equivalent.

'At least now, our driver has the same bells and whistles, and, even though judgement of output quality is very subjective, many people who have seen our results say that the output quality is at least as good.'

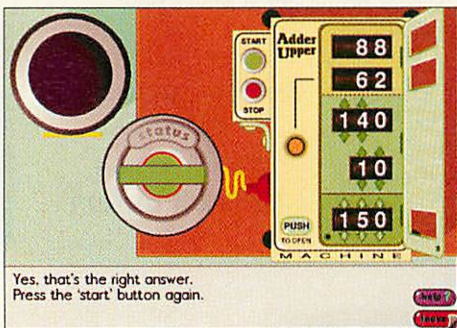
For full details, contact Spacetech at: http://www.spacetech.com, tel: 01305 822753.

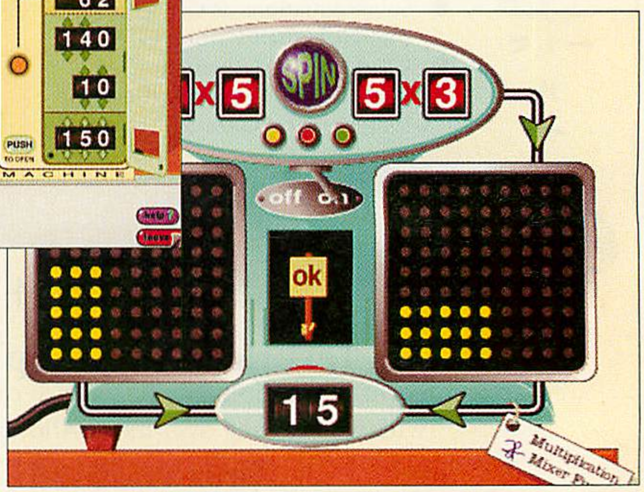
Interactive numbers

The latest release from the Sherston educational software library is *Number Works*, a multimedia CD-ROM designed to promote confidence and ability with numbers for Year 3 and some Year 4 children. The scene is set in an old factory.

You have to complete various activities there, all of which are designed to complement work in the classroom maths lesson. Activities include mending cranky old machines found on three different floors of the neglected factory.

These machines have been designed to teach, practice and consolidate many of the numeracy skills required by the National Numeracy Framework.





Number Works is available on triple format CD-ROM (*Windows*, Mac and Acorn) and is suitable for children from 8 to 9 years. It costs £49.95 + VAT. Sherston can be contacted at tel: 01666 843200,fax 01666 843216, e-mail: info@sherston.co.uk, Web: http://www.sherston.com

HTMLPro goes up and down

Version 1.4 of *HTMLPro*, the HTML conversion package for Ovation Pro users, has just been released. Numerous minor changes have been made and the price has been dropped.

A single user licence used to be £40 and is now £29.95 inc. VAT, the Primary site licence has come down from £60 to £49.95 and the secondary site licence drops from £65 to £49.95.

The business price remains £70. *OvationPro* and *HTMLPro* (single user) purchased together now cost £159.95 inc. VAT.

Prices are valid until the end of July 1999. For more information, contact Levens Software at e-mail: tel: 0500 121 242, fax: 0500 131 288

Easi/TechWriter's plus

Icon Technology showed the latest versions of *TechWriter* and *EasiWriter* at the recent Wakefield show. New features include support for Acorn's plug-in protocol to allow Java Applets to be run inside an *EasiWriter/TechWriter* document, animated GIFs images and Animator files and support for the PNG (portable network graphics) file format.

There are also over 100 new user defined keyboard shortcuts, and graphics can be inserted to the left or right of multiple lines of text. For more information about these Pro+ versions of *EasiWriter* or *TechWriter*, contact Icon Technology at tel/fax: 01778 590563, Web: http://www.icontechnology.net, e-mail: sales@icontechnology.net.

New EFF Typography CD

The Electronic Font Foundry (EFF) has announced Volume 2 of its Professional Typography CD. This will contain all the fonts contained in Volume 1, plus new fonts and, in particular, fonts aimed at users in educational circles.

Formats supported include: RISC OS, Acorn Publisher, Windows PostScript and Windows TrueType. EFF says it is taking orders for the new CD now and early birds will benefit from a discount. The offer, which closes at the Acorn South East Show on 3rd July, reduces the existing user upgrade price from £49 to £39 and the full price from £99 to £89.

Discounts are also available on school and business licences. For more information, tel: 01344 875 201, e-mail: sales@eff.co.uk or see the Web at http://www. eff.co.uk

Kosavo appeal

No sooner has Paul Johnson recovered from raising thousands of pounds from the Acorn community for the Comic Relief appeal, but now the Kosovo crisis has stirred him back in to action, this time in partnership with Dave Clare of Clares Micro Supplies.

For this effort Paul has produced a CD-ROM stuffed with the contents of all previous *Archimedes World* magazine cover discs, by kind permission of Tau Press.

The CD is priced £6.25 inc. P&P or £5.60 if you manage to pick one up froma show. Credit card orders are being taken by Clares. Of the purchase price, Paul is promising a full £5 will goto Kosovo charities. More information is available on the Web at: http://www.acornusers.org/comicrelief/Kosovo.html

Irlam updates i16 sound card

A while back we brought news of Irlam Instruments' new high quality sound sampler card, the i16. Since then, the specification has changed and the final product has been completed – it was shipping just before the recent Wakefield show.

The main addition to the card's specification is the addition of an option for pure digital input and output. This allows direct digital connection to any device sporting a digital port, like some CD players, DAT and MiniDisc recorders.

Other key features include sampling rates up to 50KHz, auxiliary input for mixing in the host computer's own audio output, audio waveform display with peak meters plus the ability to save Acorn Replay and PC Wave format files. Irlam Instruments, tel/fax: 01895 811401, e-mail: sales@irlam.co.uk, Web: http://www.irlam-instruments.co.uk

In brief

A Wheely great mouse driver

Student, John Scott, promised to make a basic Microsoft wheel mouse driver he wrote a couple of months ago available for RISC OS, free of charge. Exams delayed him a bit, but the software is now available from his Web site at www.york.ac.uk/~jjrs101/. You will need RISC OS 3.6 or later to use the driver. John can be contacted via e-mail at: jjrs101@cs.york.ac.uk

TopModel news

Sincronia, the Italian company which develops and produces the remarkable *TopModel* 3-D modelling package for RISC OS, was present at the recent Wakefield show as the guest of Spacetech, who distribute the package in the UK.

A new module, called *TopBones*, was demonstrated at the show by Sincronia. This adds several functions to the main *TopModel* application, including the ability to insert and manage bones and skeletons into models. It is transparent to other tools, including the forthcoming *TopMotion* feature. There is also a 3rd release of the *TopModel* resource CD-ROM.

CDFSFiler

PEP Associates has announced CDFSFiler, an enhanced drop-in replacement for Acorn's CDFSFiler. It boasts a much improved and extended, music CD disc player with a CD database, track title editor and playlist editor. Cache technology has been introduced to enhance the data retrieval performance of the CD-ROM drive.

Acorn's ShareFS is supported, as are PEP's own VirtuaCD and CD-Net products. Last but not least, it's mostly available free of charge from the PEP Web site (http://www.pep-assoc.co.uk/Products/CDFSFiler/). Only the CD-ROM cache technology and the CD database are available as optional extras to the basic product, costing £9.95 each.

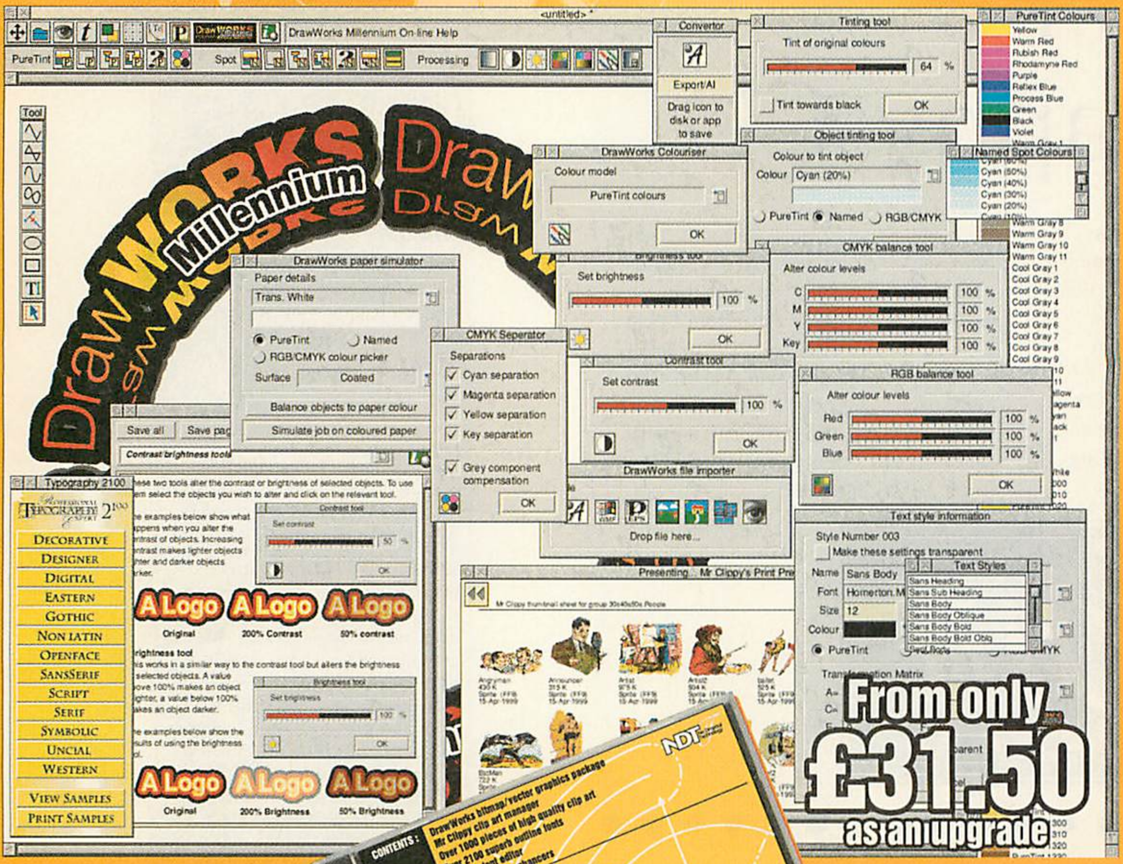
ISDN Follow Up

Last month we brought news of a new ISDN terminal adapter from PMC Electronics which includes modem-style features like fax and voice messaging capablities normally absent from such devices. The claims are perfectly true, but we have since discovered that the additional features are *Windows* software-based and so unlikely to be compatible with RISC OS. For more information, PMC can be contacted at tel: 0990 561001 or check the Web at: http://www.pacecom.co.uk

DrawWORKS Millennium

the complete graphic design studio on one CD-ROM

PURPOSE : graphic design & illustration



Some of DrawWorks features:

- DrawWorks vector/bitmap graphics package
- Over 2100 superb outline fonts
- Complete copy of Typography 2100 Expert
- Over 1000 pieces of clip art
- Over 630 vector clips & 394 bitmap clips
- NEW Mr Clippy clip art manager
- Nested clip art groups and WMF file support
- Dr Fonty font editor
- Import & Export of EPS PostScript™ files
- Export Acorn fonts as PostScript™ Type 1
- Import WMF (Windows MetaFiles) drawings
- Can be run from CD or hard disk
- Complete integrated package
- All clips already referenced by Mr Clippy
- Colour print preview *paper simulator system*
- CMYK and Spot colour separations
- Tint objects shades of any colour
- Alter CMYK/RGB colour levels
- Contrast & Brightness tools
- User defined multi-document text styles
- Comprehensive illustrated on-line manual
- Realtime interactive help
- PureTint and Named spot colour pickers
- ViVID enhancers for Pre-RiscPC computers
- Automatic drop shadow tool
- Print tiling across multiple sheets
- All files fully compatible with Draw files
- OLE sprite editing using !Paint
- Configurable user levels
- Example effect worksheets
- Auto convert text to paths when required
- Custom line width / pt size tools
- Export EPS, JPEG, GIFF files
- EuroSymbol support using special fonts
- Automatic colour filling/tinting tools
- Map making tool
- Lining style tool with custom styles
- Access clips directly from DrawWorks
- Full font editing facilities
- Tint bitmap images for use as backgrounds
- View font examples without installing
- iDesigner application to choose fonts for you
- Anti-aliased file export (Sprite & GIFF)
- Turn font groups on or off from DrawWorks
- CMYK grey component compensation
- Font catalogue printing
- Spiral text tool & kerning of outline fonts
- PostScript™ font names database
- On-line font dictionary
- Easy to use installer application
- Quick and easy access to Draws features
- Auto-grouping of objects
- Hierarchical toolbar with grouped tools
- Tear off object tool bar
- DrawTrix image effects processor
- Produce Isometric 3D projections easily
- Bend objects and text round circles
- Fit objects and text into pre-defined moulds
- Make and keep your own mould designs
- Save custom effects for different tools
- Configurable undo buffer
- Set default font for new documents
- Full control over Draws preferences
- Spot colour separate sprite files
- Easy to use and quick to master
- The professional choice for graphic design
- Tested on Risc OS 4 (pre release version)
- Over 440Mb of applications, fonts & clips
- Requires OS 3.1+, 4Mb Ram, CD-ROM

Review Comments on DrawWorks & Typography Fonts

"...excellent...I throughly recommend DrawWorks Designer..."
Acorn Publisher

"Does for Draw what Cosworth did for the Escort."
Acorn User

"...it may hardly be worth buying and other vector graphics program...Order it now - I guarantee you won't be disappointed!"
Archive

"I think I will be ditching ArtWorks!"
Mr T. Leicester

"THE program I have been looking for...excellent!"
Mr B. Warrington

"...the best value fonts collection...the package oozes quality, and the standard of Typographical design is very high...an absolute must...truly excellent value for money."
Acorn User

"...NDT as used by iSV produces superior results."
Acorn Publisher

"...very comprehensive...this CD-Rom can be recommended to anyone..."
Eureka



NDT™ No Dropout Technology
Includes NDT fonts exclusive to iSV Products

DrawWorks Millennium Pricing

Single user copy £61.50
Site licence copy £121.50
Upgrade* from DrawWorks Designer £31.50
Upgrade* from DrawWorks2 £41.50
Upgrade* from Mr Clippy £31.50
Upgrade* from Dr Fonty £31.50
Upgrade from Typography 2100 £31.50
Site licence upgrade* from DrawWorks Designer £61.50

*upgrade requires the return of the original products master disk and original products site licence if upgrading from site copy of DrawWorks Designer

All quoted prices (unless stated) are for single users versions only. Special offers relate to single user versions only. Offers valid till end Aug 1999

Overseas orders please add £2.00 carriage

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This advert was produced using NDT fonts from Typography 2100 & DrawWorks Designer

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DrawWorks Millennium

As I described last month, iSV are upping the vector design stakes with a new version of their *DrawWorks* software. *Millennium* combines a whole range of new functionality with the rather dated *Draw* application, and seeks to bring it all up-to-date for the modern RISC OS user. iSV's app tags itself onto *Draw* in an effort to patch up it's many interface inadequacies, while providing an extended range of features.

This difficult task is fulfilled rather well by *Millennium,* and it's certainly easy to pick up for a new user – a vital feature of only the best software. The basic system of offering toolbar icons for all those hard-to-reach menu features hidden away by *Draw* works well, but you have the distinct impression this is just a patch for *Draw.* You still have to use the select tool to highlight an object before you change it's style, a far cry from the excellent drag and drop of the forthcoming *Cerilica Vantage.*

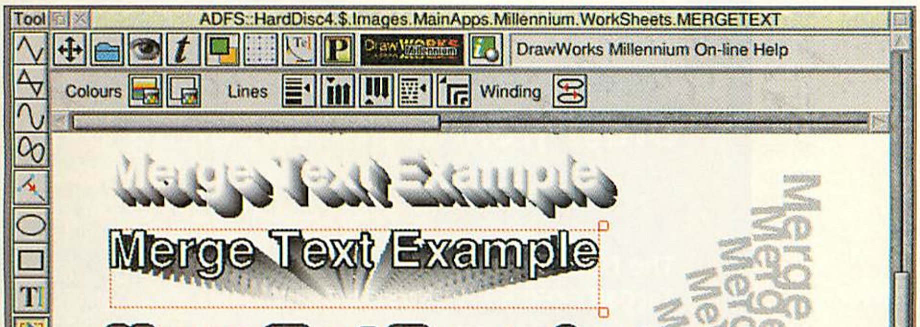
Similarly *DrawWorks* goes only part of the way in dealing with the more complex print abilities of *Vantage.* However there's still a good range of features with fairly comprehensive import and export, and an attractive number of special effects.

On top of the basic application you also get a whole range of extra goodies bundled onto the *DrawWorks* CD. The excellent font editor, *Dr Fonty,* is accompanied by the usable, but rather silly, *Dr Clippy* .

There's also a good stock of fonts and PD sourced clip-art to get you going. This really makes a complete package and is a great way for beginners to get started with just one purchase.

DrawWorks Millennium is a very usable package and if you liked the original *DrawWorks Designer,* or would like to keep your vector editing simple with an extended version of *Draw,* then this is the right purchase for you. At the end of the day however, *Millennium* is still only a patch for *Draw.* Full functionality (and hopefully ease of use) for a vector package can only be found in *Cerilica Vantage.*

DrawWorks Millennium is available from iSV for £60 or via upgrade from *Designer, Mr Clippy* or *Dr Fonty* for only £30. Contact iSV on 01344 455769.



5. Try ungrouping these examples to see how they are made.

In brief

Digital knowledge

Cadmium Systems have launched an interesting introduction into the use of digital images. Despite being aimed broadly at the Mac market, 'Understanding Digital Images' provides a useful guide to digital source imagery that's still very applicable to RISC OS users.

It'd be nice to see a Web page, or more comprehensive guide, taking this introductory pamphlet further, but whether you're interested in royalty free images for DTP or digital artwork I'd recommend getting hold of this free guide. Simply call Cadmium on 0800 436867.

TopModel news

The Wakefield show was one of the biggest events in the Acorn graphics calendar in recent years. On top of the several major packages which were launched by companies like Cerilica and iSV, Spacetech released the third TopModel CD-ROM.

Featuring the same combination of 3D objects, textures and 3D fonts for use with TopFont, this is another handy resource for users of the premium RISC OS 3D modeller.

Even better is Sincronia's latest addition to the TopModel suite; TopBones. The plug-in is a skeleton management system, and according to Spacetech '...allows you to insert skeletons into models and move the whole structure by moving the single bones. It greatly enhances the positioning of models and can be automatically used by the (forthcoming) animation suite, TopMotion'. I'll be looking at TopBones in more detail next month.

Contacting me

Keep those Picture of the Month entries coming in for a chance to win a copy of Cerilica's Phantasm application and have your artwork in print. You can contact the Graphics page by writing to me, Paul Wheatley, at Acorn User, Tau Press Ltd, Media House, Adlington Park, Macclesfield, SK10 4NP. Or preferably, by e-mail to graphics@acornuser.com

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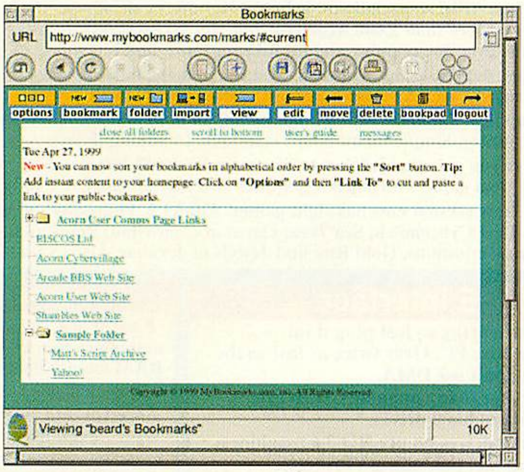
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Revision 15

Top marks for MyBookmarks

MyBookmarks is a free Web-based store for your personal hotlist or bookmark list. By keeping your online list up-to-date, you can access your favourite sites when you're at home, round at a friend's house, in the office or at school.



When you've registered with MyBookMarks.com, by giving your name, location, country and e-mail address, you choose a user name and password. You can then start entering your bookmarks. Fortunately, although the default screens use Javascript to select functions, there is a no-frames option that works quite well with standard versions of *Fresco* and *Browse*.

URLs and their titles are entered into form fields and their locations chosen within folders by setting buttons on a graphical directory display. You can perform all the usual create, move and copy functions within the MyBookmarks Web filer. The import-list-from-browser function does not appear to work with *Fresco* or *Browse* though.

MyBookmarks provides a very useful facility for teachers who can create bookmarks for specific teaching topics, these can then be accessed by their students from any machine in school. The system is ideal for users who do not always sit at the same machine, or use machines with differing browsers.

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It's important

It's easy to forget that there's a potential readership of millions for the words that we casually toss onto our Web pages. First impressions *do* count, and the way words are written say as much about the writer as do the words themselves.

In the old days of movable type, compositors and printing presses, spelling and grammatical errors in published works were quite rare – everything was proof-read several times by different readers before finally going to press. Web publishing is now done instantly, and such errors are easily missed when we alone check our own work.

One famous grammatical hobby horse of mine is the correct use of "it's" and "its". It's easy to get right when you realise that "it's" is only ever used as a contraction of "it is", (or possibly "it was" or "it has"). It should never be used as the possessive form of "it" which is always "its".

Use "its" to refer to a property of a grammatically neuter object, as in the statement "My computer has lost its settings". "Its" belongs to the same set of possessive pronouns as "his" and "hers". Don't be confused by the use of the possessive noun in a phrase such as "David's computer has lost its settings". Also note there are no plurals that can ever take an apostrophed "s", so a sentence containing "the greengrocer's cabbage's" is quite wrong.

In brief

HTMLTidy sorted!

Since I reported that W3C guru Dave Raggett's HTMLTidy tool, for checking and correcting HTML source code, was ripe for an Acorn conversion, two versions have been ported to RISC OS. Justin Fletcher and Iain Truskett have each produced RISC OS desktop versions that correct and tidy up sloppy HTML coding, and produce neatly laid-out source listings.

Iain Truskett
http://koschei.shada.com/software/tidy-15apr99.zip

Justin Fletcher
http://www.thevillage.ndirect.co.uk/justin/tidy.html

History of Lenny

Cyber Druidery is the unexplained sub-title of the Somascape and MIDIWays Website of Lenny. The MIDI index leads to useful specifications of general MIDI, instrument mapping, the RISC OS-specific MIDI interface, and MIDI file Websites. Other downloads include Historian, a utility for ANT *Fresco* Web browser users. By viewing and editing the *Fresco* history file, the program allows you to retrace your steps online where you forgot to bookmark.

Somascape
http://www.argonet.co.uk/users/lenny/index.html

Goodbye Arctic

Steve Pursey finally closed his West London Arctic BBS at the end of April. Arctic has contributed much to the Acorn BBS scene in the last six years. Steve started in May 1988 with a Viewdata BBS system on a BBC Micro, and graduated to an Archimedes A410/1 in 1993 when Arctic BBS was born.

Due to users' increasing interest in the Internet, Steve has decided that it's time to move on. We wish Rose and Steve good luck and good surfing.

Contacting AU

Keep sending me interesting URLs for the next yoUR List by e-mail to david@arcade.demon.co.uk, or mail #2 on Arcade BBS 0181 654 2212.

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3.2 Gb	£99	£146
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A3010/3000 includes APDL IDE interface, A3020 includes fitting kit Larger sizes and HD+CD available

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Tiger - £15 Lets you use very long descriptive filenames. Unlike some products this is very robust as it works in parallel with the filer so can't corrupt discs.

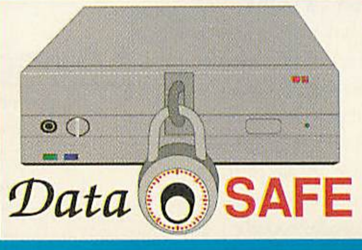
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Data Safe *Super* has the drive fitted in a removable drawer. You can fit a similar drawer to your Risc PC (best if you use our IDE card) and then just unplug the drive from the RPC and transfer data to another machine using the Data Safe.

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PD direction

Bob Ardler continues our discussion of the future of PD on our platform with a withering but balanced attack on overly complex programs.

'There is a rich vein of PD not accessible to ordinary users. I mean those apps which are way harder to use than their help files or manuals allow for. Zap in its latest incarnations suddenly became inscrutable until James Aylett produced a superb help file, making a complex program immediately usable, and giving non-techies hope of learning some of the clever stuff. There are commercial programs with a PD fringe to them – things like applets and vixen, written by clever enthusiasts. This fringe should help to keep RISC OS alive; but not if ordinary users can't make sense of the docs.

'The biggest no-go area contains those tantalising ports of enticing PD apps from alien platforms. Many of them, like GNU and Unix ports, come from a command-line environment. To use them you need to know more about file, directory and path layout and the command-line, than a RISC OS user should have to.

'RISC OS people expect a very simple drag-and-drop installation process, not a morning spent threading a labyrinth of files; thereafter we want a simple life with mouse and keyboard in the happy Acorn way. Something is badly wrong if you have to *Dir SkuBedu or take the app by its little hand and show it where to find the library.

'Some of these ports have been done by Unix-dwelling students and teachers, still sentimental about their Acorns. In a good mood they may write a 'Wimp front-end'. Then they distribute it to like minds, and move on to another world. You want documentation? Use the original GNU docs. Er, Acorn documentation? Why, sure. Download the source any time you like.'

There was a plaintive letter in Archive from Bill Richardson, asking how to make *TeX* work. He's the man who uses *TechWriterPro* to produce the *Mathematical Gazette*:

'A while ago if you got an article in *TeX* you could drag it to the *TeX Wimp* front end (Datex), convert it to DVI form and view it with Paul Field's superb *DVIview*. But you can't do this with the new version of *TeX*. It's reverted to command-line or task window use, and I haven't got it to work yet.

'Suppose you're not a programmer, but still need to write simple programs. Well, Griswold's excellent *Icon* is flourishing in version 9, but the Acorn port is by Giovanni Lo Conti, whose English doesn't stretch to a help file. So you have to choose between v8 with a memory fault and v9 without Wimp access. Suppose you're doing a computer science course and you want to do your homework on your Risc PC.

'You've got Acorn ports of Bison, Flex, Gawk, XLisp, Scheme, Perl, GNU C++, GNU SmallTalk. Riches indeed, were they not hopelessly documented and a nightmare to get going. I don't know the answer to this problem of PD documentation. Kidnap James Aylett and set him to work? Persuade Acorn mags to do articles on PD packages?

'Add in the commercial apps (no names) whose upgrades have left their docs prohibitively out of date and you have a waste of great software.'

I really have to agree with a lot of what Bob has to say. The reason we use RISC OS is because it's easy, fast and efficient to use. If we're to keep the advantage that our platform offers us, we have to match the usability of the OS with the quality of the apps and utils we run on it. But for me, reams of documentation is a weak solution. The way forward is good interface design in programs which you can pick up and put into use straight away. I'd love to hear your views on the future of Public Domain software within the changing RISC OS market of today, so please get in touch at the usual address.

Utilities update

FishMPEG is a simple desktop front end for playing audio MPEGs with Peter Teichmann's audio MPEG code. Straight forward and with plenty of potential for development, keep checking the web site for updates. Browse to http://www.fish.zetnet.co.uk/

FreeMem the essential clock and free memory display program by Liquid Silicon has been updated with a minor bug fix. There's a lot of these programs around, but Liquid Silicon's still remains the best supported and most tastefully designed. Download it from http://www.cybervillage.co.uk/acorn/liquid/download/

WinDragFix patches a problem with RISC OS that stops multi tasking when you drag a window with panes. The patch can be found on author Matthew Bullock's Web site at http://dialspace.dial.pipex.com/matthew.bullock/

VideoPlus performs the somewhat unusual task of decoding Video Plus numbers to reveal the actual times and recording details. Why you'd want to do this on your computer I'm not quite sure, but author James MacDonald is planning to have an encode version on his Web site very soon. Check out http://www.netbook.demon.co.uk/vp100-pr.zip

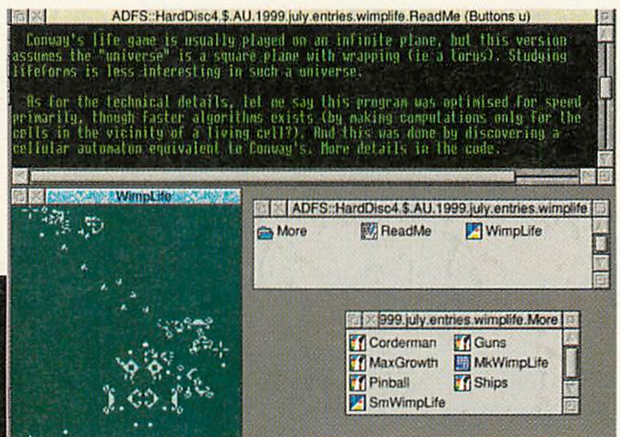
HTMLTidy is a ported application that parses HTML files and, perhaps not surprisingly, tidies them up. The idea is to sort out sloppy handwritten code or to make that ridiculously over-complicated editor-sourced HTML into something a bit easier for the average human to understand. Bit temperamental, but worth experimenting with if you have to edit other people's HTML. The Tidy Web site is at http://eh.org/~koschei/software/tidy.html

Codecraft

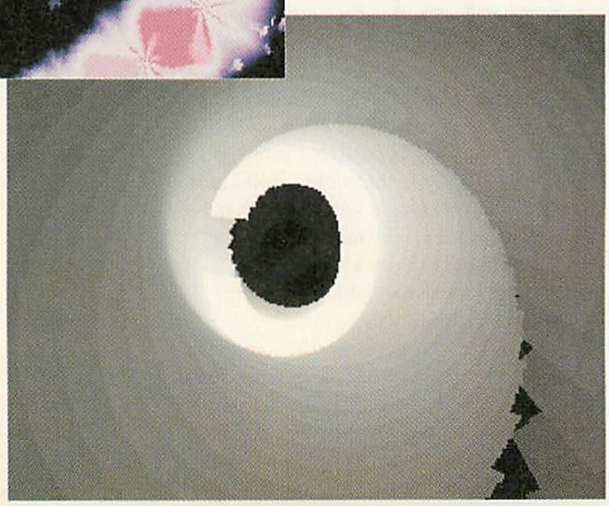
At the time of writing the Codecraft, 1 and 4K coding contest is still going strong. The 1k contest has seen quite a few entries already, which are well worth checking out. Among the chunks of code entered are a couple of interesting sound modules from David Gamble including a rather nifty echobox effect.

The graphical entries seem to be coming out on top so far however, with Paul Thompson of DFI entering a psychedelic zooming effect, David Gamble with a fading letter zoom and an ingenious maze game from Tony Haines. My favourite so far is Alain's *WimpLife*, providing an excellent version of *Conway's Life* game, complete with several interesting starting points. But for some reason, I just can't wait for Paul Thompson's 4k web browser...

Of course, the entries are great to try out and enjoy, but the real value is the supplied source code. This is a great way to learn from the best coders on the scene and to encourage new coders to start off. Full information on the contest at http://www.cybercable.tm.fr/~brooby/code.htm







In brief

Evolution ending

The closely fought Evolution demo contest has finally come to an end with the official announcement of the Nutters as the overall winners for their entry: *Zero.* Congratulations to the team for a fantastic production that narrowly pipped DFI's *K2* to the top spot. Both of the top entries have really taken RISC OS demos to a new level of both programming quality and amazing design.

I think the element that really pushed the Nutters into the lead was the stylish design and production (the award for which they also took) demonstrating the importance of a central theme. The best coder award unsurprisingly went to Paul Thompson of DFI who again demonstrated a fantastic technical knowledge but applied it with a good design sense.

The Best Musician was voted in as *Knackered Amp* of Divine Nature and the Best Artist category was won by your very own PD editor, for the bitmap-laden *Mobius.* The winner of the reader's and voter's prize was Mr Andrew Conroy, who bags a copy of the amazing new *Cerilica Vantage* vector design software worth £200.

Many thanks to Cerilica for the competition sponsorship and thanks also to all the readers who got involved and voted in the competition. The biggest shout however, goes out to all the teams that entered for their hard work and devotion to the scene.

Attacher

John Allen's *UUcoder* has been one of the best of a collection of UU encoding tools available on the Web for some time, but John has now replaced it with a fully comprehensive application by the name of *Attacher.* This new app does just about everything conceivable for a UU tool, including multiple file attachments and application to application dragging. Very handy. Point your browser to http://www.bramber.demon.co.uk/john/soft.html

Contacting AU

You can contact the PD page by e-mailing me (but no large files) at pdpage@acornuser.com

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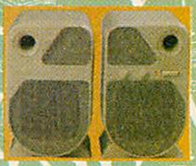
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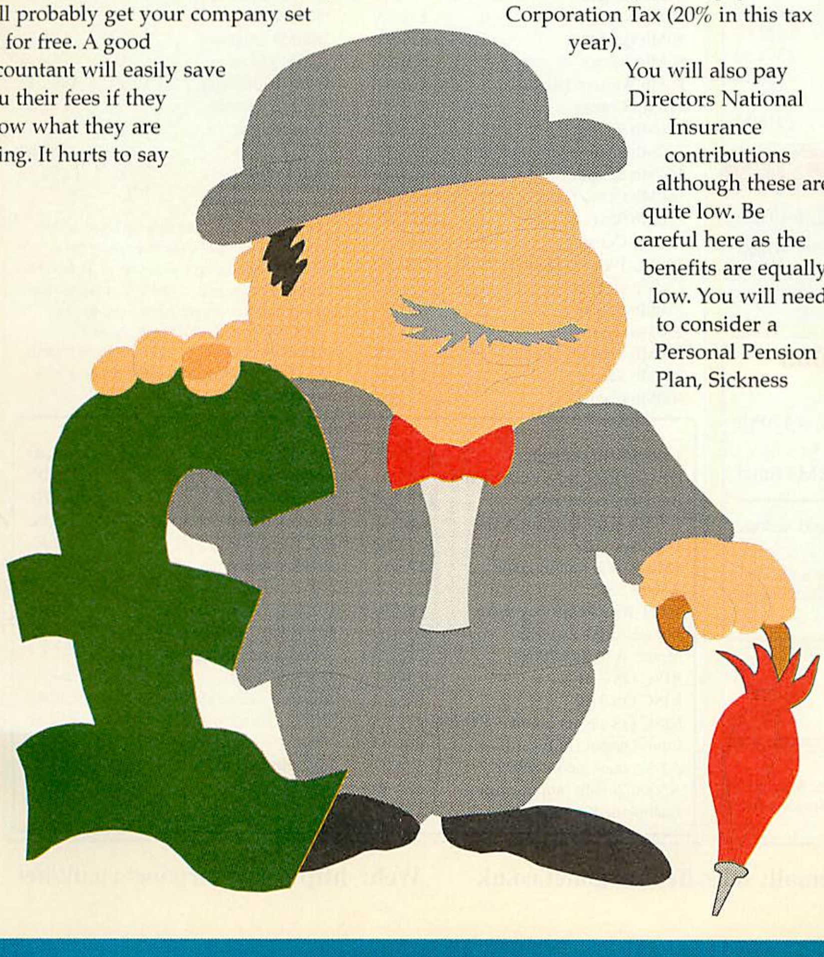
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Contracting

Welcome to this, the third part of my series, on the joys of being a freelance computer contractor. In the previous articles I have outlined the advantages, and how to go about getting that all important first contract. So, an agency has made you an offer, you have met the client and got a start date – what do you do next?

At this point you have some serious decisions to make. I strongly recommend that you consider contracting as a Limited Company. If you do you will need to set that company up. The most cost-effective method of doing this is to use the services of an accountancy firm who specialise in computer contractors.

In this way you kill two birds with one stone; your accounting will be taken care of by specialists in the area, and you will probably get your company set up for free. A good accountant will easily save you their fees if they know what they are doing. It hurts to say it, but a good accountant *will* save you money.



So, you have accountants and a limited company, registered with Companies House in your name. Strictly speaking you need a Company Secretary and this is where a *significant other* comes in useful. It also means that they can be paid either a wage or dividend, depending on their shareholding.

Now you need to change your mind set: You are *not* self-employed, you are a Company Director working for a company. You may *be* the company, but you need to start thinking about the business as separate from yourself. For example, you will be paid quite a small salary, probably up to your Personal Tax Allowance. The rest you will take as dividends for which you will pay Corporation Tax (20% in this tax year).

You will also pay Directors National Insurance contributions although these are quite low. Be careful here as the benefits are equally low. You will need to consider a Personal Pension Plan, Sickness Insurance and a Health Plan. If you are in hospital, or incapable of working through illness or accident, who pays the bills?

Then there's VAT. Unless you are expecting a very high income for the company, you probably will not need to register for VAT compulsorily. But there are quite major benefits of registering, even if you are below the threshold. For a start you can charge VAT on your invoices, this will be paid and sits in your account earning interest for three months until the quarterly VAT return. You will be able to claim back VAT on goods and services paid for in connection with the running of your business. This can mount up to quite a sizeable amount on your monthly expenses.

For example, a major concession to contractors is that because they are considered to be mobile, they can claim a mileage allowance on journeys to and from a client's site. There is a two year rule, but even if the contract last, longer than two years there is no claw back. You cannot claim back VAT on the whole amount, but you can claim on that part which is deemed to be for petrol or diesel. Take my advice and register for VAT.

By the way, do not consider buying a car via the company or selling the car you own to the company or any other scheme in which you run a car via the company. It's not worth the effort and quite frankly company cars are now so heavily taxed that the disadvantages outweigh almost any advantage.

Although you have an accountant you will need to do a little simple book-keeping to provide the accountants with the figures on which to base VAT Returns, Tax Forms, Year end accounts, tax certificates, salary slips and so on. This is where your RISC OS machine comes in handy. A simple linked spreadsheet on which you record mileage on one sheet and transfer this to an expenses sheet with all your other expenses is all you need. Any spreadsheet package on the Acorn, for example, *Pipedream*, *Eureka* or *Schema* can cope with this undemanding yet vital part of running a successful business.

Cover Disk

Caves

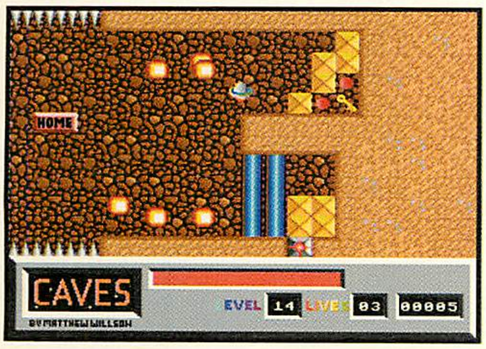
This nice little game is by Matthew Willson and is the second PD version. To quote from the Help file 'The game is a platform/space flight/obstacle course/shoot-the-aliens type game. There is no implausible plot line.

'You have to navigate over 40 levels of space caves in your ship, shooting aliens, robots, tanks, boomerangs, generators, bases, guns, and crumbly blocks'.

It's good fun and it also makes you think a bit, which is probably why I didn't complete level 1 this morning at the first time of asking. You'll wonder how I failed when you have a go yourself, but I was tired and had a rough weekend...leave me alone.

For help on the game see Matthew's online guide at: http://www.willson68.freeserve.co.uk/guide.html

Matthew has also included a list of passwords hidden away in the game to help sleepy editors on a monday morning. Change the file type to text (it's currently a data file) to view it properly.



ECS-Utils

ECS-Utils started out as the shareware application *Mytils* and, like its predecessor, is a nested collection of utilities. As has been recognised since the early days, the fundamental user-interface aspects of the Acorn GUI are hard to match, let alone beat. However, some additions are always helpful. Hence *ECS-Utils*.

Filer additions

ECS-Utils has grown as-and-when new facilities were needed. At the moment it will (with key presses):

- Change the display mode used in individual Filer windows (full info, small icons, large icons) or change the sort order;
- Provide a quick and easy dumping ground for random files.
- Put windows to the front or back of the stack;
- Shut any window (Filer or otherwise);
- Centre any window within the current screen display;
- Toggle any window almost to maximum size and position at the top left of the screen;
- Close current directory and open parent Filer directory;
- Close all open windows on a filing system (IDE, ADFS, CD-ROM, IZIP – which will also eject a Zip disc) with Adjust-click on the filing system's iconbar icon;
- Eject a Zip disc from an ArgoFS drive;
- Maximise or minimise any window – even if it has no normal toggle size or adjust size icons.

Version manager

The Version manager is a utility entirely new to any platform I have heard of. Drag a filer object (file, application or directory) with the Alt key pressed and a new directory will be created with a name derived from the first five letters of the name of the filer object followed by the letters 'Vrsns'.

The point of this? If you are developing an application, program, or any other work which requires continual updates this facility will automatically create a directory tree of the versions, date-stamped and everything. As you create a new one, Alt-drag the last version to *ECS-Utils* then save the new version – no need to use a new name.

So, all in all a very comprehensive program – I'm unable to list everything it does here, but see the manual for more in depth information. It's currently Shareware, so if you use it send £10 to ECS Ltd, 2nd Floor, 107 Carlton Road, Nottingham NG3 2FB.

END

Disc information

The software on the cover disc has been compressed using !ArcFS 2 from VTi, and are opened by running a copy of ArcFS then double-clicking on the archive to open it. There is a copy of !ArcFS on each disc. Most software will run straight from the archive, but some programs may need to be copied out of the archive before being run, uncompressing them in the process. Any program that saves a file to disc, for instance, will be unable to do so into the archives on the disc.

Faulty disc?

If your disc is faulty, test whether it will verify by clicking with Menu on the floppy drive icon and choosing Verify.

If it fails to verify or is physically damaged you should return it to Acorn User, Media House, Adlington Park, Macclesfield SK10 4NP.

The *Acorn User* cover discs have been checked for viruses using !Killer version 3.001 from Pineapple Software.

Art of booze

Walter Briggs explains the use of masks in Part I of his new series

The brief from *Acorn User* was to create a series of articles using *Photodesk*. The criteria – produce work that will help the reader to see the numerous possibilities within not only *Photodesk*, but other 24-bit art packages as well. Especially I hoped to show the potential of software that uses masks, or Alpha Channels, as they are sometimes known.

I will be using *Photodesk*, but most of the terms will apply to other 24-bit packages, although some may not be able to handle, or create more than one mask channel.

I'll also be using *Artworks* to create some line and text work, and then transport the resulting imagery directly into *Photodesk*. Again not all packages will allow the direct transfer of *Artworks*, or drawfiles into their pages, or mask channels. I know *Studio24* does, but other programs may not have this facility – check your handbook. Another reason for using *Artworks*, was the ease of distorting text, something vector packages excel at.

Since I was to demonstrate the use of mask channels and layers, I chose to paint a bottle and glass – such a transparent medium would enable me to test, in particular, the usefulness of the 'layer' option in *Photodesk*. Had I but known the work involved – with the difficult fluted-shaped shoulder to the bottle, and the dreaded deadline, hanging like 'the sword of Damocles', I may have thought again. Still, I was able to evaluate the usefulness of the masks, and hopefully the next feature will test 'layers' to the same degree.

Drop of the hard stuff

The first stage in the operation was to produce a layout of the design. So out came the 'virtual' sketch pad, and I quickly produced some electronic working sketches.

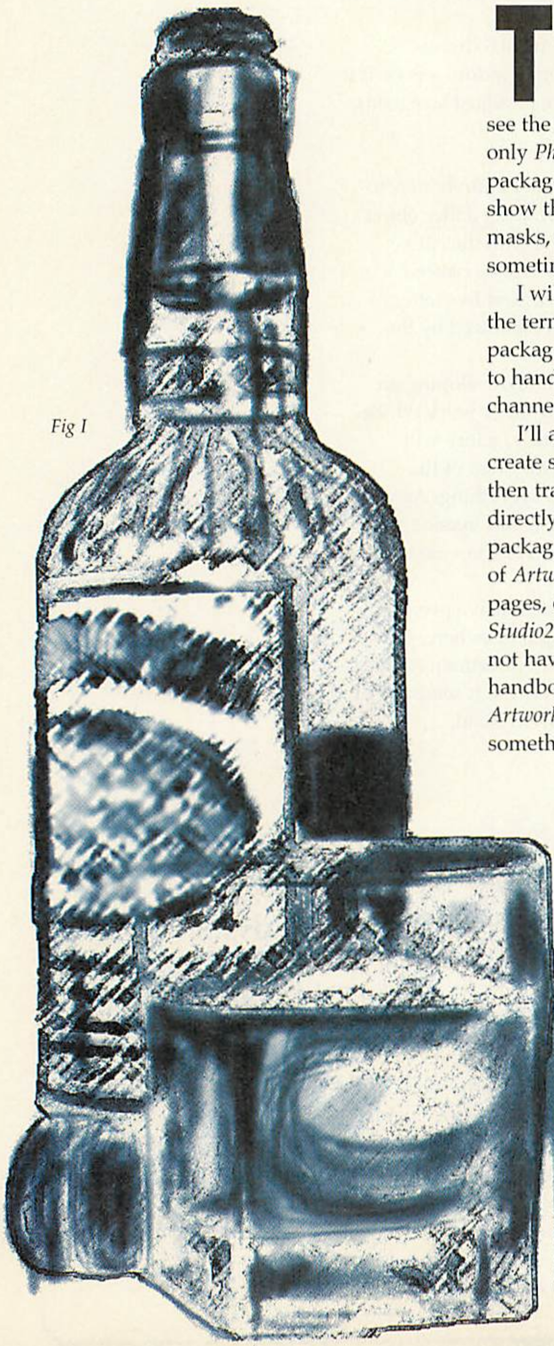


Fig I





Fig II



Fig III

In this wonderful computer age there is no longer a need to work-up numerous drafts on paper, though it is sometimes a good thing to rough out a few ideas. This gives you a basis for your digital composition.

If you are working with a traditional sketch pad, then you can scan your ideas into your machine, or simply tape your drawing onto your monitor, and the trace the outline into your favourite program.

My sketch included the glass, (Figure I) though in this article I will only work on the bottle – I will keep a 'wee dram' for the next issue. The sketch was created with a small airbrush in *Photodesk* and is a bit rudimentary, but was enough to help me see the overall composition.

Labelled in ArtWorks

The file was saved as a sprite, which *ArtWorks* accepts with aplomb. It was then a reasonably simple task to create the text for the bottle, including the neck label and the main label, which described the delights that lay within.

Figure II shows the newly traced bottle outline and the text – an inducement to imbibe of Acorn technology.

The various fonts I had were close enough to the original ones to work as substitutes; only the main name would need a little extra work.

To make the subject matter a little more interesting, I turned the bottle until only half the label was visible.

Unfortunately the name of this famous liquor had a very distinctive font that had a dotted line down the left edge of each letter, and I possessed no comparative style. The only solution I could come up with was to choose the closest font to the original, copy and alter it, then combine the two fonts.

I filled the original font with the required brown, then 'cloned' it. The reason for producing a clone



Fig IV

(shortcut Control+K) of the text, is that a clone is created exactly on top of the source text. It is then a simple operation to move the text very precisely to one side using the arrow keys. Once the new text was moved a fraction to the left, I removed the fill, and made the outline dotted to match the style on the bottle.

There was only one problem – bits of the cloned text staggered out from behind the new text at inappropriate intervals, so a few white shapes were created to cover them.

Eventually the text was complete, and the 'envelope' tool used to bend the text to suit the actual design, and shape of the bottle.



Fig V

Here is where a little foresight would have been helpful. At the next sitting, the bottle (my model), was set at a different position to the first, so the perspective of the subject had changed!

You can see in the outline, the bottom of the label is quite rounded, meaning the base of the bottle was below eye level. This later changed, and the text needed to be straightened in keeping with my blurred vision.

Up to the neck

Once the line-work was finished, the whole *Artworks* file was dropped into *Photodesk* and pasted down as a 24-bit image. This would give me a visual representation to work with (the right hand image in Figure II).

I then went back to *ArtWorks* and changed all the lines and fills to black, this was because the next time I dropped this file into *Photodesk* it would be pasted down as a 'mask'.

Masks are used to safeguard various parts of your work while you spray contentedly over the 'open' areas. They work like a stencil or a sheet of acetate, and appropriately can be made invisible. It's also possible to vary the opacity, and hence the measure of protection they provide.

These masks, used by *Photodesk*, *Studio24* and other programs, are 8-bit masks; that is 256 shades of grey, appropriately called greyscale images.

This means if you drop a coloured file from *ArtWorks*, or *Draw* onto a mask (Alpha) channel, the various colours will be translated into shades of grey. In this way, the depth of the mask, and hence its measure of protection, depends on the colour of your file and the various greys it now contains.

A black mask will give complete protection, mid-grey, a measure of protection, and white none at all.

It's possible in some programs, including the two I have mentioned, to have a number of mask channels. This meant I could drop separate outlines from *ArtWorks* onto different channels. The outline of the bottle on one, the text on another, and so on.

Feeling green

Now that I had an outline and a number of masks to work with, I began airbrushing the top of the bottle. Even though the glass appears clear, in reality, if you look closely, there is a definite tinge of green to the proceedings (Figure III).

Highlights prove crucial in giving the image a 3D effect, and they continue down the bottle varying in intensity depending on the reflective material.

The next objective was to spray the neck label (Figure IV) and a shade of dark grey/green was used as the base. The gold writing from the ArtWorks file was fine, and so a sample was taken with the 'syringe' and a drop put on the page in case I lost the colour while airbrushing the label.

Then a very dark green was used to airbrush the sides of the bottle neck and label. You need to be very patient and use a very low opacity, building up the colour slowly, this will give you the required control. In *Photodesk* I would use about 10%; in *Studio24* (which I still believe has the best airbrush) about 3% (Figure V).

The fluted shoulders have been worked just enough to show you how the airbrush gradually builds up the colour within the teardrop shape of the mask. Figure VI shows the result of the 'magic wand' having been used to fill the mask. Once protected with a mask I could airbrush the raised shapes of the bottle shoulders.

Eventually the masks have to be turned off and the work continued freehand, otherwise the lines will be too hard.

You can see in Figure V that I had switched off all the masks, and that some over-spray has got onto the white background. This is easily removed, just invert the mask and paint the backdrop in again.

Due to the freehand work, the writing on the neck was almost sprayed to oblivion – it was strengthened

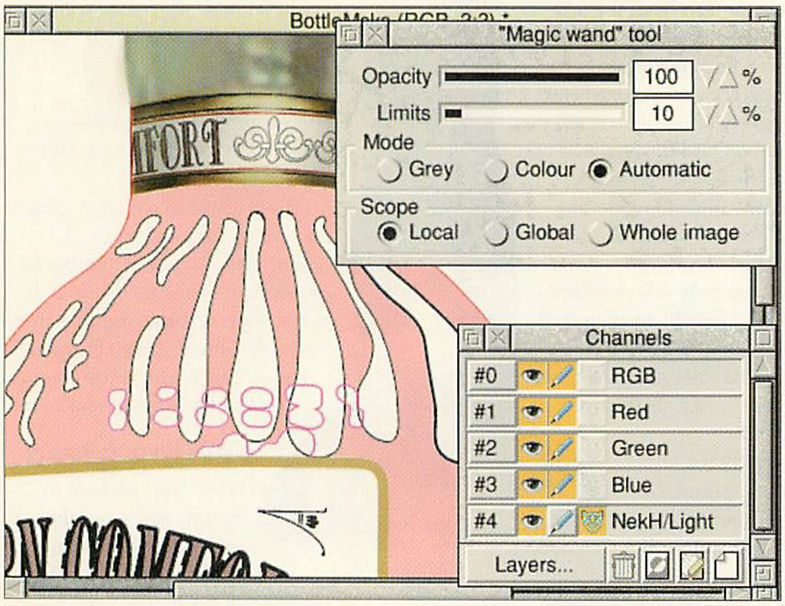


Fig VI

later, by dropping on this section of the *ArtWorks* file.

Neck text

The lower neck-band looks good, but most of the work was done within – you guessed it, hic! – *ArtWorks* (Figure VII). A series of rectangles was created – white on a radial filled brown, and the pattern and text on the top of that. All the objects were grouped, and the envelope tool employed to create the right perspective. Because the edges disappear round the bottle neck the easiest solution was to place two white rectangles either side of the label – just to hide the untidy edges.



Fig VII

This label was dropped onto the *Photodesk* image then pasted as an object (not as a mask), and the various colours kept as part of the bottle. A little darkening of the sides, and brightening the highlights complete the slogan.

Drop of the real stuff

Once the top half of the bottle was finished, my attention turned to the contents of the bottle itself. Since the basic liquid has a red tint, this was where I started.

The grey/green colour of the glass was roughly sprayed onto the rest of the clear glass, and the lower half filled with a bright pink. A similar 'fluted' effect adorned the bottom of the bottle, so a few shades were added with the airbrush. The colour was rather vivid, but surprisingly the moulded shapes on the bottom of the bottle had come out rather well.

Because of this I decided that the density and colour of the liquor would have to be enhanced by a little 'image processing'.

The colour balance was modified and the contrast and intensity altered until the image was near the right colour, while still retaining the grooved effect on the base (Figure VIII).

Though the label was now in place I wanted to complete the glass section first. This is the way I like to work – finish one section, and progressively move on to the adjoining area, in a sort of creeping natural progression.

Strong spirits

Figure IX shows the highlights created in *ArtWorks* and dropped onto the page of *Photodesk* – the white 'blobs' were used as a mask, and were actually black – they are shown in the shot as white, just so you, the reader, can see them.

The toolbar, which appears when an image is dropped onto the page, allows you to paste the objects either to a mask channel or as a RGB or CMYK full colour image. The tools allow you to accurately size and position the new objects. These ones would be the bright highlights on the raised glass section, so they were painted white, gradually, with the airbrush.

I also took the opportunity to enhance all the highlights and shadows on the complete bottle, though I would do this again before I was completely satisfied – which is never.

Paper work

Now that the glass section is finished, I can move on to the label. Even at this stage the shape of the bottle and label didn't match the shape of the text. And since I had been working for some time on the bottle in an elevated position, I had to re-work the text.

This was the easier option, since the text still existed in *ArtWorks*. It would also allow me to complete the illustration and text on the central part of the main label (Figure X).

The picture in the centre of the label was quite simplistic, and at an acute angle, so it wasn't necessary to spend a lot of time on it. (Figure XI)

The border was a series of lines with an outer band of of circles, not the easiest to emulate. But I had a great idea. I turned the outer line into a dashed line, then created a small circle and cloned and copied it until it covered all the dashes. The text and central image also

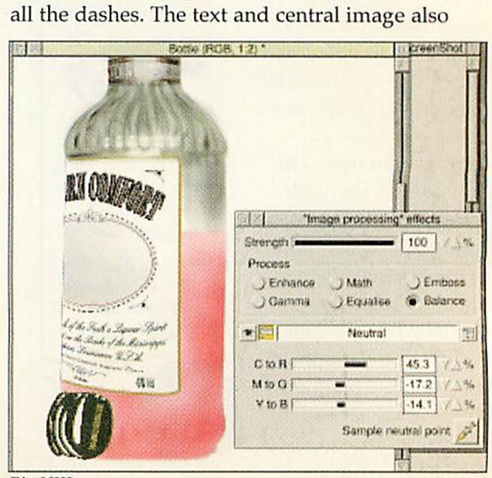


Fig VIII

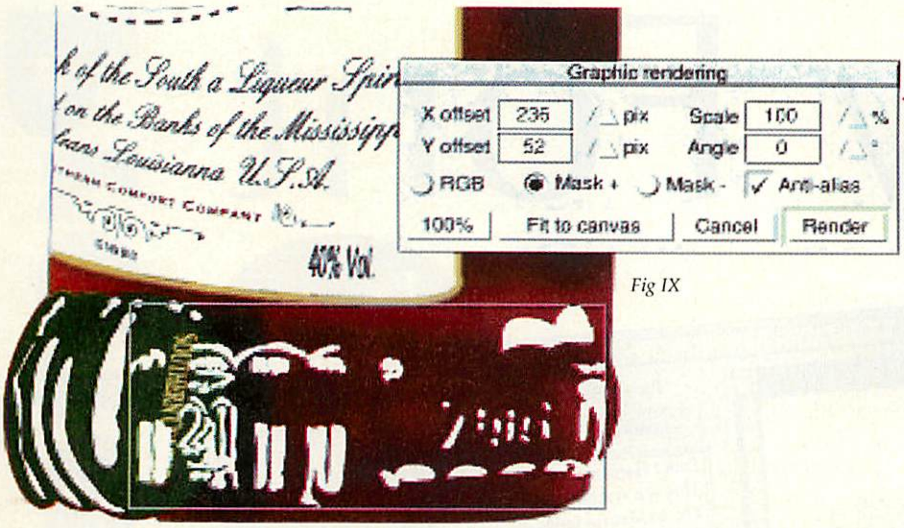


Fig IX

had to be warped into the necessary shape for the side of the bottle. Since *ArtWorks* cannot manipulate sprites, the actual picture is not set at the right perspective – but since the text and border has been distorted the eye is easily fooled into thinking all is in order.

The outside edges of the illustration were easily hidden within *ArtWorks*. A white circle was drawn in with no fill, the line width increased to cover the edges of the scene, and everything grouped and dropped into *Photodesk* (Figure XI).

Intoxicating finale

The illustration is coming on well, and I'm quite pleased. A bit more fine-tuning – the highlights intensified on the glass, the text on the neck strengthened, then on to the final section.

It's fairly simple to generate a three-dimensional look to the label. I just masked off the whole label, and used the largest brush I could manage – at least one third the width of the label. I set the opacity as low as possible, and didn't see any effect until the third pass of the airbrush. Then I halved the size of the brush and darkened the outer edges. With the same brush I painted a straight white line over the whole label, again and again, until the text began to disappear, and the outer edge became very discernible.

Because the reflections are very bright on the glass just above the label, I felt the need to increase the intensity of the white on the label itself, though it's a much softer light than on the glass. (Figure XII)

That only left the cap to be created. Because of the acute angle it was lying at, and with the addition of the glass (next month) there seemed no need to spend an inordinate amount of time on it.

Hopefully this will have given you an insight into the use of masks, and the implementation of vector images within this bit-map world.

Next time we'll look at masks in more detail, especially in connection with layers, and I should finish the composition. In the mean time have a wee shot yourself.

END



Fig XII



Fig X

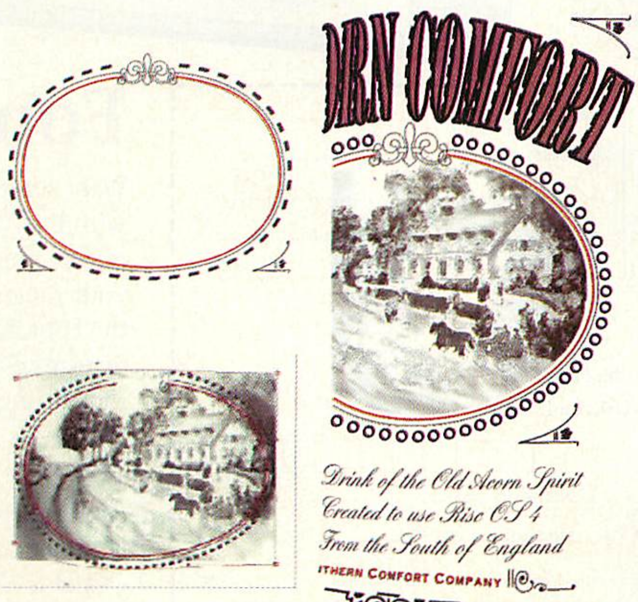


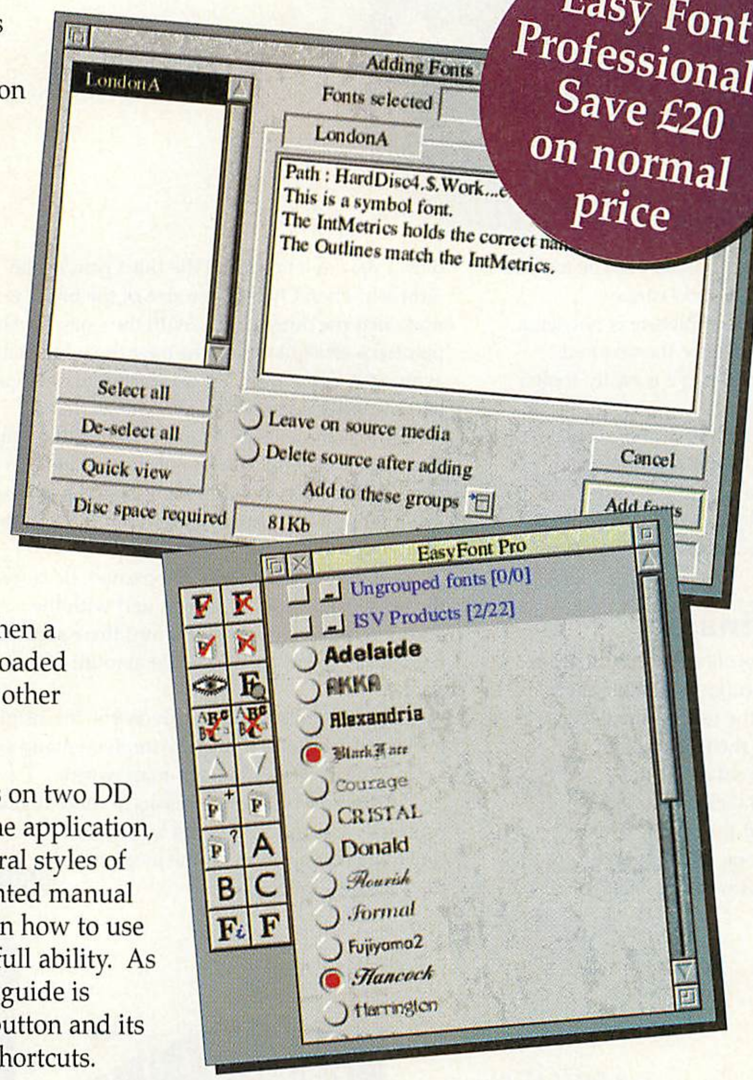
Fig XI

Easy Font Professional

Easy Font Professional - Save £20 on normal price

Easy Font Professional is probably the best Font management software on Acorn machines. This superb piece of software provides an easy to-use, yet powerful interface.

Easy Font Pro allows you to add fonts easily and quickly, as well as allowing the fonts to be viewed for simple selection.



Other features of Easy Font Professional include:

- The ability to allow you to group fonts.
- Up to 40% compression
- Fonts which load only when a particular application is loaded
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Easy Font Professional comes on two DD floppy discs. One contains the application, while the other contains several styles of font. It also comes with a printed manual which contains instructions on how to use Easy Font Professional to its full ability. As well as this a quick reference guide is included which shows each button and its function, plus the keyboard shortcuts.

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Font Pack

Want some more fonts to use with Easy Font professional? Or maybe you just want to increase your range of fonts? If so, then the Font Pack is for you. It features over 50 different styles of font giving you a wide choice of type-faces to choose from.

For Easy Font Professional you will need a minimum of RISC OS 3.1 or greater with 2Mb of RAM and a harddrive

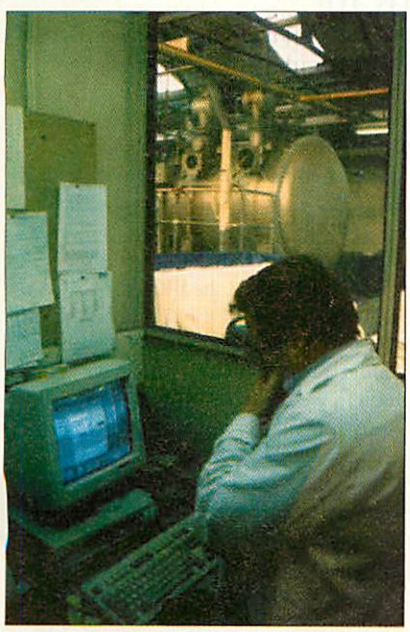
15 glorious years

Simon Anthony's dyeing to tell of Acorns in industry

It is often said that Acorn computers are not, and never have been used in industry. This is simply not the case. Irritating as this is to hear this, it is difficult to prove otherwise, as the turn over of Acorn related products in industry is quite low. There is a good reason for this – Acorns seldom go wrong, and even more seldom do they need replacing.

Electronic Control Services (Nottingham) Ltd have been keeping the Acorn flag flying in industry for a decade and a half. Currently they provide computer control by means of software running on Risc PCs. These monitor signals sent by smaller computers which themselves do the data collecting.

An example of an ECS installation is the Singlam textile dyeing plant in Wales. Fifteen years ago they were looking for the latest in computerised automation systems for use in the textile dyeing process. Their dyeing plant is not small and nor is the energy required to run it, so complex and fine control and monitoring of every stage in the dyeing process is required so that efficient use can be made of resources.



The first stage in monitoring what's going on is to get some sensors and hook them up to something cheap, solid, reliable and simple. Something which can cope with being left alone for years without maintenance or any sort of care or even attention. Fifteen years ago the perfect equipment for the data logging, storage and transmission systems were BBC Micro computers, that was when they were installed. They are still running perfectly today.

The data is sent to a central computer system from the BBC machines via a current loop circuit. At the same time an Econet system sends and receives signals to and from the control machinery (Econet is the Acorn proprietary data signalling system, now dropped in favour of the faster Ethernet).

The process of dyeing a fabric is very detailed and complex. A recipe of chemicals has to be mixed and added at the right stage in the dyeing process and in exactly the correct quantities. This information is entered in to an industrial application specifically written by ECS – running on an Acorn RISC OS machine. There the complex and daily varying details of the current recipes are typed in and sent via the Econet system to the file server computer on the factory floor.

Another terminal RISC OS computer, running monitoring software, is used next to the server to keep track of the state of play over fifteen or so massive pressurised dyeing vats. Each machine runs its own program and sends real-time updates of the progress of the job to the monitoring software.

The dyehouse application scans the output from the machines and updates the monitor display, while at the same time allowing programs to be altered, sent to, or removed from any of the controllers in the factory. The chemical recipes can also be entered and sent to the controllers without disturbing the rest of the system – that is multi-tasking for you in the real world.

Before the RISC OS computer came out, all the recipes and processes has to be controlled by hand and eye. As soon as it was possible RISC OS machines were added to the, by then, five year old existing BBC system. When the Risc PC was introduced the control software was updated to take advantage of the new machines – but the main code did not have to be changed at all.

This idyllic setup looked as if it had had it's day when Acorn pulled the plug on Econet. The fear was that the code would have to be totally re-created in order to cope with new communication protocols.

However this turned out not to be the case. Replacement Ethernet cards used the same software calls as the old Econet system. Once the new cards were put in place the software, originally written over ten years earlier, worked perfectly. Hands up for any 'Industry standard' systems that can say anything like that. Obviously requirements in the dyeing industry have changed a great deal over the years, and so a rewrite is finally called for.
But that will be another story. END

Contacting ECS

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Millennium Toolkit

Mike Tomkinson tests out one of the best ways to defeat the Millennium Bug

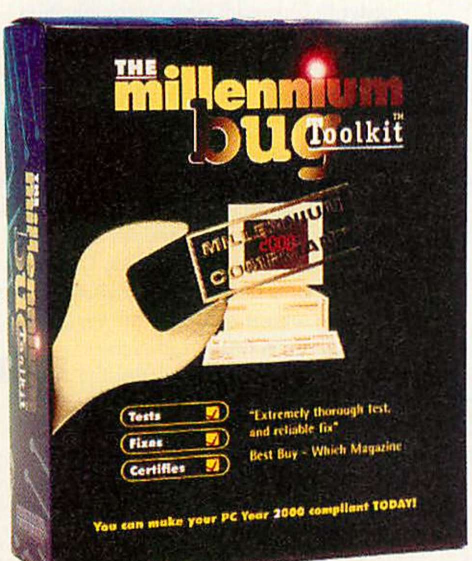
Like most Acorn users I react to the Millennium Bug with the same 'Permission to turn on smug mode, Sir' as a certain character in Red Dwarf. The bug won't affect my computer system, and I've had the urine extracted often enough by PC owners for sticking with Acorn, so I'm not too sympathetic.

However, there are Acorn users who must be somewhat worried, either because they have to use PCs at work, or they have PC cards in their Acorns. It is also worth understanding what the problem is for PC owners so, as well as being smug, we can speak with authority.

The problem, as I write this, is that no-one can say to what extent the Millennium Bug will affect us. We currently have a spectrum of reactions from 'No problem' at one end to 'The End of the World is Nigh' at the other. While I think that selling up and heading for a croft in Scotland to become self-sufficient is a little extreme, it does pay to be cautious. A little prudent planning might not go amiss before The Big Day.

The right tools

There are now a number of software products available to help you combat the effects of the Millennium Bug for PCs.



One of the best is *The Millennium Bug Toolkit* from Computer Experts Ltd, and this is the product under review in the rest of this article.

For the purpose of testing the kit, which is software based, I am going to use a recently purchased PC with a 400MHz Pentium II chip.

This is hardly a fair test as the system was sold as fully Millennium compliant, so I would expect no problems with it. But this particular system was misrepresented to me by the advertising in another area, and if they lied about that then they may have done the same about the Millennium compliance.

The Millennium Bug Toolkit comes with a refreshingly slim manual and single floppy disc. The accompanying Press Release promises to identify and fix all problems with a 'No fix, No Fee' guarantee.

I was using the Single User version, but a version exists for various networks including the two most common: Novell and Windows NT. I know many schools use Novell for their administration systems and NT for their education and/or administration systems, so this has some relevance to education users.

The CD-based Software Scanner, according to the press release and the manual, scans all the software executables on the harddisc and compares the version against the manufacturer's compliance statements to see if it's already been fixed. This also means that if a bug-fix is applied in the form of an update you can re-check the software for compliance at a later date. Unfortunately the Single User, Hardware-only kit does not contain the Software Scanner, so I cannot comment further on it.

Hardware

Here a little background is in order. The first IBM manufactured PC, produced in 1980, required that you enter the date and time whenever you turned the computer on. This was the the old XT PC. In 1984 IBM produced the AT PC which handled the time/date problem by having a Real Time Clock (RTC) chip embedded on the motherboard.

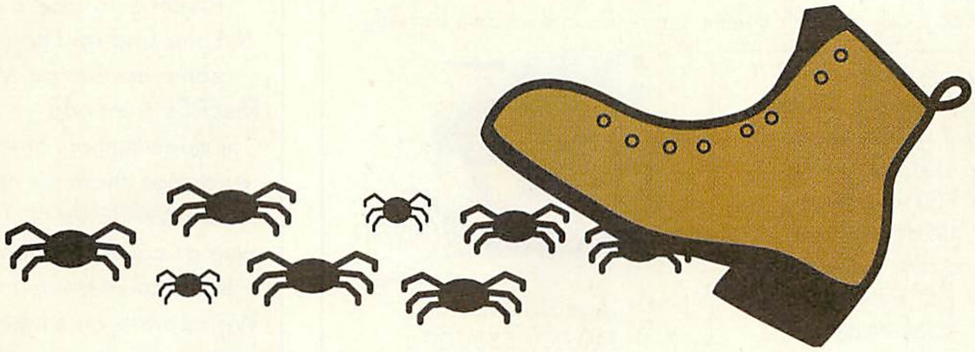
This stored the time/date, and every time the computer was switched on the BIOS (Basic Input/Output System) read the RTC to obtain the correct time/date. I have simplified the process but you should get the idea.

The problem we are faced with today is that the RTC stored the date in the format DD/MM/YY and not DD/MM/YYYY, thus using only two digits for the year. This is fine until the Millennium roll-over when 00 becomes 1900 and not 2000.

What really complicates the issue, if it were not complicated enough, is that the Operating System, DOS, keeps its own time and is informed

by the RTC that the date is 1/1/1900. The problem here is that this date is invalid to DOS, and so it interprets it as the number of days which have passed since 1/1/80 – returning an incorrect date. The most common date returned is 1/4/80. All in all a complete mess.

If you have been following all this so far you will realise that any bug fixer must deal with one of two problems with the hardware.



The first is if the system is switched on during the roll-over from 31/12/99 to 1/1/2000, in which case it must monitor and correct for any inaccurate date change in real-time.

The second is where a system is switched on any time *after* the roll-over, and the fixer has to cut in when the system is re-started and fix the problem. Complicated, eh?

It gets worse as the Year 2000 is a leap year, I know by the usual rule it should not be, but this is an exception that happens every 400 years.

Getting started

Anyway, enough of the background stuff. The manual, for all its slimness, provides comprehensive information on how the bug fixer works to tackle both the software and the hardware problems.

Computer Experts Ltd have certainly done their research, and you go into the testing phase with a great deal of faith in the product.

This is important, as any mistakes could seriously affect your computer system. Any product claiming to remove a major potential problem *has* to be one in which you have faith. You must be sure that it will remove the fault, but not cause another at the same time.

The software performs a number of tests on your system which, if it passes them, should ensure a high degree of confidence of Millennium compliance.

The system you are testing should be in MS DOS mode, so from *Windows 95/98*, Start->Shut Down->Re-Start in MS DOS Mode. Enter *The Millennium Bug Toolkit* disc and at the A: prompt type 'test'.

Well, it seems easy enough so far. The first thing the software does is to transfer your System files onto the floppy thus creating a bootable floppy. The second thing it does it to make a backup of your CMOS settings – better safe than sorry.

When you re-start the computer with the floppy in the drive it takes you through the various tests. Each test reports a *Pass* or *Fail*. As I would expect, my computer passed all but the *Windows* Short Date setting test. This was deliberate on my part as I wanted the computer to fail at least one test to see how the software would adjust it.

What happens next is that the fix is applied in the form of a small Terminate and Stay Resident Program (TSR). You are then offered the opportunity of re-taking the tests. This I did, and sure enough this time the computer passed the *Windows* Short Date setting test with flying colours.

So far, so good. The hardware checks out. Obviously the older the machine, the less chance of passing some, or all of the tests, so 386/486's and P75/100's are more likely to require the fix than newer PII's or PIII's. It is also recommended that you use the program again in the run up to the Millennium, and in particular if you change any settings on the system.

The only problem I had with the hardware testing phase was that the date/time were wrong on the system when I re-booted. At least the date was beyond 2000 and the system was still working, so it was easily adjusted to the correct time/date.

In a commercial environment suppliers are often required by customers to certify that they are compliant, or are working towards Year 2000 (Y2K) compliance. To that end a Testing Certificate is supplied with the *Millennium Bug Toolkit*, stating that your system has undergone compliance testing. It does not guarantee full Y2K compliance but should satisfy anyone that such testing has been done.

Is it worth it?

In conclusion I found the *Millennium Bug Toolkit* to be an excellent product. Obviously it has a somewhat limited sell-by date, but if it helps your PC over the Y2K problem it will be money well spent. As for the software on the computer, all I can suggest is that you have the latest versions with any bug fixes and patches applied. END

Product details

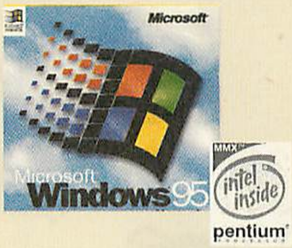
Product:	Millennium Bug Toolkit
Price:	Single user – £38 (plus VAT) Hardware only Network – £58 (plus VAT) Hardware and Software Scanner Network and multi-user licences available upon request. The usual discounts apply to schools, charities, and so on.
Supplier:	Computer Experts (UK) Ltd, Level 5, New England House, New England Street, Brighton, BN1 4GH
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Keeping Control

Michael Cowgill continues his series on MIDI controllers

Greetings again for the fourth part of this series on MIDI controllers. This time I'm going to talk about controllers 72 and 73 which control Envelope Generator Release and Envelope Generator Attack respectively, together with an explanation of Envelope Generators in general.

These are XG specific controllers, so only those of you with DB50 daughterboards, external Yamaha XG modules (such as the MU10), or XG compatibles like the Korg N5RS will be able to experiment this month.

GS modules do provide access to this control via NRPNs, so much of this article will be relevant to Sound Canvas owners or other GS compatibles (such as the Korg O5R). I shall be covering NRPNs next month anyway so you won't miss out for long.



Envelope generators

First of all let me explain what an Envelope Generator is in terms of sound synthesis. The early synthesisers used a method known as 'subtractive synthesis' to generate sounds electronically.

This means that an oscillator was set to generate a specific waveform (such as a sine wave), which was then was passed through various circuits, altering the sound by taking bits away from the original wave form. An Envelope Generator in this process usually controlled four aspects of the sound:

- The rate at which the sound started, or **Attack**
- The rate at which the sound settled down to a continuous sound, or **Decay**
- The rate at which the sound died away while the key was held down, or **Sustain**.
- The rate at which the sound died away when the key was no longer depressed, or **Release**.

This form of Envelope Generation is consequently known as an ADSR envelope (see Figure I). It is possible to increase the complexity of this by adding successive stages to the Decay and Sustain phases of the envelope.

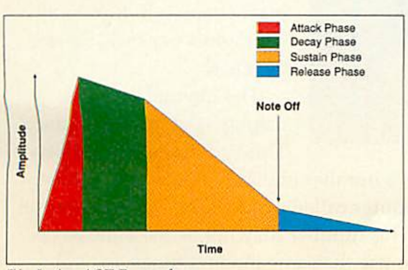


Fig I: An ASDR envelope

The post GM context

In a modern AWM device, such as the DB50XG, where the sound sources themselves are not editable, the Decay phase as I have outlined it is redundant. The Attack, Sustain and Release phases can be increased or decreased within the limits of the existing sample however.

On the attack

The EG Attack controller (73) is very useful for things such as making a piano sound crisper, for making string sounds mellower by slowing down the attack, or for tightening the attack up to give them more 'edge' or 'bite'.

The one thing to remember about EG Attack in this context is that the effect will vary depending upon the sound that you are editing, and you will only be able to make subtle changes, unlike those in synthesis where the sound is being created.

This controller uses 64 as 0 (no effect on the sound), thus enabling the attack to be slowed as well as accelerated.
One final word: this controller doesn't work as you expect. Slowing the attack is achieved with values 65 to 127, while accelerating it is achieved with values 63 to 0.

The EG Release controller (72) is used when you wish to edit the length of time the sound continues when the key is no longer depressed. This *does* work as you would expect it to, with values 65 to 127 increasing the length of time a note continues after receiving a note off, and 63 to 0 decreasing it.

At first sight this would seem only to be useful for strange effects, but in practice sounds such as guitars and other percussive string instruments, such as dulcimers and sitars, can sound more real after tweaking the EG Release value. Pianos too can benefit from a slight increase in release time. I'm sure you will soon find out what's appropriate.

Tools for realism

I've often wondered why Yamaha didn't assign a controller to EG Decay, but during the writing of this article it occurred to me that stringed and wind instrument players can vary the attack of their instruments, and that string players can also control the release. The decay, however, is irrelevant as it is beyond the control of the player.

I must, therefore, assume that it is a attempt by Yamaha to give XG programmers the power to add more realism to their music than is possible with standard GM devices. **END**

Contacting me

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Native retouching

Simon Anthony kicks off his short series on photo-retouching for free

A very long time ago I had a chance to take a photograph of my sister and my great grandmother, as it turned out this was the last photo taken of the two of them together. It has always been one of my favourites.

Unfortunately there is a fault with it that, had it not been the last one, would not matter all that much. My sister's jumper needed a good Star Trek-like tunic-tug, but it didn't get it in time. So now, twenty or more years later, I have put the power of an un-augmented Acorn to the task.

Figures I and II show my efforts in the traditional before and after format and, although not a perfect job, it's good enough for me. This is all done with just *Paint*, *Draw* and *ChangeFSI* – so it's effectively free.

The first task of getting the image from a snap on to the desktop was done using a £99 scanner from a highstreet box shifter – plugged in to my home-brew PC. A real Acorn-style one would have done as well or better, but any digitising method will do.

Good quality digital cameras are still very expensive, but I find that Photo CDs are now a good way to get from camera to computer – if you have a CD drive that is. Once you have your image any RISC OS 3.1 or better machine can perform the following tug trick.

What I did

The original scan was a little too dark, that's what you get for £99. It was also a JPEG file. This is a

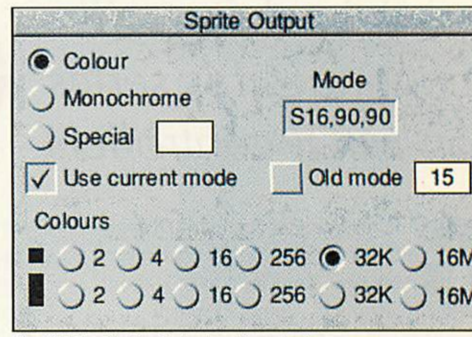


Fig III: The Sprite Output option window

compressed image file format which *Draw* can load, but that is not much use here as only *Paint* can really alter the pixels. So, I converted it to a sprite and lightened it up using *ChangeFSI*. This much under-used and under-rated *free* program can do a great deal for your photos

To load a file and convert it from a JPEG (if it is one) just drop it onto the *ChangeFSI* iconbar icon. The output sprite mode will be set by default to that of the current screen. To get the best quality you will have to work in a high mode anyway, so this default setting will be fine if the original picture looks good in it.

To alter the output mode use the options on the 'Sprite Output' item on the menu. Figure III shows the 'Sprite Output' option window. 'Use current mode' is ticked and the other settings of the window, in this case, reflect the current screen mode values. The computer is therefore in a 32,000 colour mode with square pixels.

The mode display icon in this RISC OS 3.7 version of *ChangeFSI* is a bit odd. It's a hangover from earlier versions of the OS. Frankly I don't know exactly what S16,90,90 means but it changes to S32,90,45 when you select 16 million colours in this window. A rectangular pixel shape is indicated by 90x45 dots per inch; square by 90x90.

The manual says the display is of 'no significance'. This is definitely true when it displays a number like 29376836 which is what my computer called a 32K, 1024x768 square pixel screen. This number may not be the same next time you use the same mode settings. In 'Old



Fig II: The retouched image



Fig I: The offending article of clothing

modes' it shows the correct old mode number though.

The *ChangeFSI* menu as shown in Fig IV shows that the main menu leads off to the Processing options window. Here I have ticked only one box, that of Gamma Correction. This tilts the shape of the black to white contrast gradient, bending it according to the figures shown in its box. The effect is that of making the mid ranges of a picture lighter – with a value above 1, or darker between 1 and 0 – without altering the darkest or lightest areas.

In the real world there are a massive range of brightness levels between these two extremes, but once reduced to film or video – and then on to computer – we have far fewer steps to play with. In the end altering the Gamma can make the most of what brightness levels we have.

Contrast, by the way, is the absolute value of full white with respect to black. As full white can't get bigger than 'all on' and black can't get less than 'all off' there is no real contrast control, but Gamma comes close.

If the range of levels available in your picture does not cover all the possible steps from full white down to full black then you are not making full use of the available contrast range – although the picture may, and probably will, look better that way. To use every step to its full potential the 'Extend dynamic range' option can be used in *ChangeFSI*. This puts the darkest parts of the picture at full black and sets the lightest at full white, the steps inbetween will be set according to the current value of the Gamma contrast gradient, but now there will be more of them to play with.

Don't expect anything to happen when you use Black Correction or Brighten Picture as they are only for black and white pictures being prepared for a laser print out.

Warnings

The above, like just about all that comes next, is a matter of taste, and the final settings are entirely dependant on the type of picture you are using. Try it and see. It is always sensible to spend a lot of effort in getting the best possible starting material as, apart from simply being better, it can be a real pain finding the superior version once you've almost finished the retouching job.

That said, each job is a law unto itself and doing the same thing twice, or more often, can make for a splendid end product. So it's no real disaster if you do have to start again from scratch. Beware though – spending ages removing Red Eye from a photo late in to the night *can* transfer it to yourself in the morning. The optimum time to stop fiddling with your masterwork need not be when you have the 'perfect' result on screen.

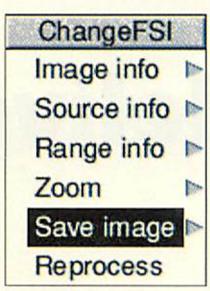


Fig V: ChargFSI's main menu

Choices

The machine I used for this example was a Risc PC with enough VRAM to allow 32,000 colours in a large screen mode. Had the original photo been of better quality I would have used 16,000,000 colours. This number includes shades of brightness of every colour as well by the way.

If your machine can't properly display a photo – as many PC created Web sites show – then no amount of care taken when retouching is going to make it look any good. That means Mode 12 is out, at least for colour, 256 colour modes can look surprisingly good though, but only on an Acorn. *ChangeFSI* does a splendid job down-converting from a higher mode, but even we can't make a low mode image look better by up-converting.

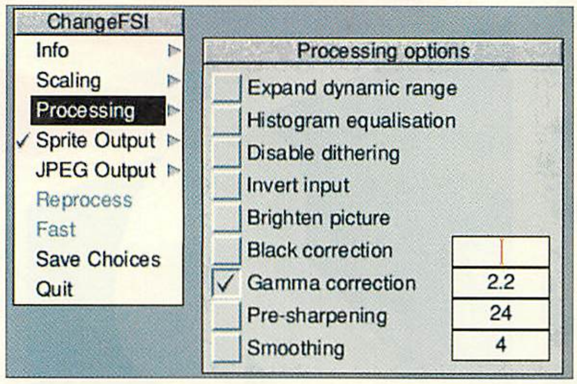


Fig IV: Some of the processing options in ChangeFSI

Starting paint-ing

To be able to use *Paint* the picture must be saved as a sprite (an electronic photograph where the grain of the picture is determined by the number of dots (pixels) per square inch making it up). When *ChangeFSI* has done with your work save it as a sprite by putting a tick by the 'Sprite Output' item on the menu. Then use the menu you get by clicking the Menu button over the output picture (Figure V) to do the normal drag and save thing.

It would obviously be daft to drop anything other than a Sprite on to the *Paint* iconbar icon, that is why I have never done it deliberately, but I did it once by accident and it loaded perfectly. Experiments showed that this works fine with RISC OS 3.6 or 3.7. It will also work with earlier OS versions, but only if *ChangeFSI* has been 'seen' by the computer. It just has to have been booted, not even run. It won't even load itself on to the iconbar, but it will do a full mode conversion to get the JPEG to be loaded and displayed in the current screen mode as a sprite in *Paint* – a handy shortcut sometimes.

The next step is the hard one. Here you need a steady hand and a clean mouse. This is because *Paint* does not have an Undo facility. This must be a hangover from earlier machines where memory was at a premium. Even today you can run out remarkably fast when moving sprites around.

Decompressing a JPEG scan from a friend's PC for example can make a 500k file fill 20Mb of memory. But the Risc PC can manage easily. If you don't have that sort of space then stick to lower screen modes which are far smaller in terms of memory and file size but are not of photo quality.

So, how do we get round this lack of undo-ability? The trick is to take snapshots of the parts of the picture you want to tweak and work on them one by one. Then put them back on top of the original (but best) image and there you are. Just how to do that must wait for next month. Hint, we use *Draw* a lot. END

Objects of desire?

In a new series, Greg Scott looks at the most fashionable of the industry's programming accessories

Since the early 90's, Object-Orientated Programming has become a universal term in the software industry, from academic curricula through to corporate consultancy firms. It describes a revolutionary change in the entire software engineering process, from initial specification through to programming and maintenance. By applying its philosophy to modern, quality programming languages such as C++, Eiffel, Smalltalk and Ada, all involved are beginning to reap the productive and financial rewards of OOP.

These articles are about applying professional object-orientated techniques to any software development, large or small, and about increasing the productivity and efficiency of all Acorn programmers. A knowledge of programming is not required to grasp the methodology of either the software development process or OOP. In fact the majority of industrial software development lies not in programming, but in the analysis and design stages, and these will be covered shortly.

We are mostly concerned with the programming stage, and the object-orientated language C++ will be used in this respect. It is widely available on most platforms (see Figure I), and often used to teach OOP principles at universities. These articles are also ideal for existing C programmers wishing to make the 'increment' to the C++ language. If this is the case, the first thing to appreciate about C++ is that anything you could do in C, you can also do in C++.

C++ Compilers available for Acorn Computers:
Acorn C/C++
Easy C++ (Beebug)
GNU C/C++

Figure I

The advantages of OOP

So what makes OOP such an attractive and popular school of programming? There are two main advantages in using an object-orientated language. The first is that the properties of such a language allow development of systems that, when altered, only require modifications to relatively small parts of the program. This means that maintenance and improvement of a program become more straightforward tasks, as does writing the program itself.

The second is that because of the encapsulative and polymorphic properties of OOP (described later), parts of a program can easily be used within a completely different project.

Current software development

Before we uncover the roots of OOP, let us begin with the software development process. Just as with other industries, there are well-documented methods for successful software engineering, on any scale. Bearing in mind that theory and reality are two very different situations, consider the system illustrated in Figure II.

Each stage of the process feeds into the next by the creation of a document, or collection of documents. Typically, a client will first supply a software developer with what is known as a Statement of Requirements. This document describes the customer's needs for what the end software system will actually do. Somewhat bizarrely, often the customer does not actually have a complete picture of their aspirations for the project, but rather a short and abstract idea of its specifications. If you are programming your own application, this initial stage may seem irrelevant, but in an industrial situation it is often a good indication of the immediate success of the rest of the project.

Requirements analysis

Requirements Analysis is the technical examination of the statement of requirements. In an ideal world, the statement of requirements would be so specific and comprehensive that this stage becomes redundant. However, in reality, staff in the development team often have

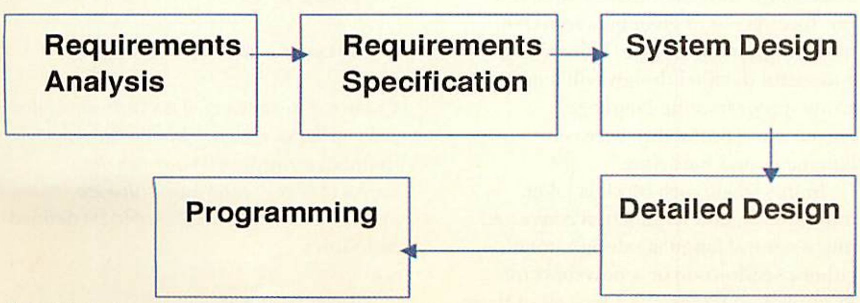


Fig II: The Software development pipeline

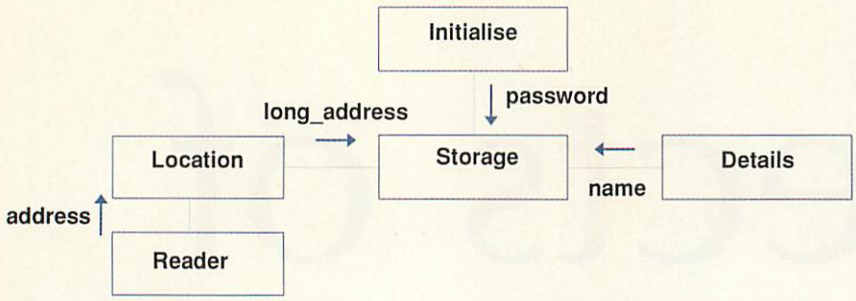


Fig III: System design

to delve deeper into the meaning of the statement of requirements, ask many more questions and clarify ambiguities. The customer may always be right but unfortunately they often don't have a clue about what they really need.

Requirements specification

The Requirement Specification is the technical description produced as a result of the previous analysis. Also known as the System Specification, it is a very detailed document covering not only the functional aspirations of the system, but also factors such as the estimated amount of maintenance required on the completed system and the level of staff training required.

At a functional level, the document will contain specific descriptions of the system's tasks, any constraints (such as hardware resources, memory, response and operating times) and any agreed formats or protocols which the system must comply to – for example, if a client wishes to expand on an existing computer system, the same filing system must be used.

The importance of the requirements specification cannot be overstated. It is the document from which the rest of the system is solely based, and it is a major reference during later testing and maintenance of the system. It also proves useful when producing documentation for the completed application. Any errors left in the specification will undoubtedly lead to serious problems later in the development stage. Again, if you are writing a program for yourself, it is still important to get down on paper the exact functions and requirements of your idea, in as much detail as possible.

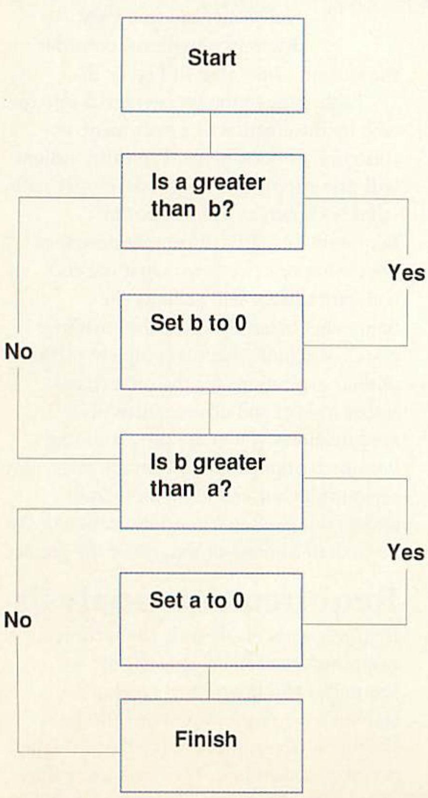


Fig IV: Detailed design flowchart

System design

System Design produces a detailed map, an architecture of the system, by taking into account every relevant detail from the requirements specification, including the constraints. It is typically represented in graphical form (see Figure III) as a web of blocks, just as one might first picture OOP itself. Each block is considered an individual function. Each line represents a call between functions, and arrows and variable names (next to the arrows) indicate parameters between the functions. For example, in Figure III, the function 'details' passes name into 'storage'. A function that calls more than one function would be represented by more lines from the function block.

Detailed design

Detailed Design could be omitted altogether in many situations, often because the documentation which it produces is not of great benefit to the final programming stage. However, a successful detailed design will lend itself to any programming language, encouraging portability between languages and hardware.

In this stage, each block is taken individually, and its function converted into a natural language design notation, either pseudo-code or a flowchart for example (see Figure IV). Once all of these stages have been completed, we use the documentation to implement, test and maintain the final program. It is this programming stage which we shall focus on for rest of this series.

Object-orientated programming

At the heart of OOP is what is known as the abstract data type. This is a collection of both data and the functions that operate on that data. The key to good OOP is to focus more on the structure of these abstract data types, and not on the general functionality of the system.

The mechanism which defines an abstract data type is known as a class. A class is a skeleton, a template for describing the components of an abstract data type (the data and functions within it). Each implementation of a class is called an object.

A class groups together associated data structures and functions into a single object. For example, in a software system designed for a gymnasium, we could define a 'customer' class to hold customer details and have functions to change and add details. We could define a separate class called 'booking' which holds a record of daily bookings and has operations to alter them.

For C programmers, a class is most easily thought of as a *struct* with functions.The basic syntax for defining a class is as follows:

```
class class_type
{
variables
...
function definitions
...
};
```

Note that this code does not actually create an instance of a class at all, rather a definition of a class of type class_type. This is an important point to remember. To actually allocate memory and create an object, we use the syntax (noticing the use of the standard C++ comments - ' // ... ' as opposed to ' /* ... */ '):

```
class_type    class_name;
```

For example:

```
customer  jane;
```

Creates a instance of class *customer* called *jane* – assumed to have been previously defined. Returning to our previous scenario of a gymnasium software system, a customer class could be defined as follows:

```
class customer
{
```

```
char *name,*address;       // name
of customer, address
int age;                    // age
of customer
float height,weight;       //
details of customer
public:
void customer(void);
void alter_statistics(void);
void alter_address(char
*new_address);
}
```

This is a standard class declaration. After the name, 'customer', lies the variables which are local to the class. This means that any attempt to access the variables (*name, *address, and so on) will generate a compile time error. This is why we include the 'public:' keyword. Any data or functions declared after this keyword are accessible from both within and outside the class.

We directly index the components of a class using the '.' operator after the class name (not type) followed by the item we are addressing. For example:

```
customer jane;
jane.alter_statistics();
```

Calls the function *alter_statistics()* for object *jane*.

```
jane.age=20;
```

This is illegal because *age* is private to the class *customer*.

An important function, declared within our previous customer definition above, is that called customer(), sharing the name of the class. This function is known as the *constructor*, and it is called every time an instance of a class is created. So in the previous example, when the object 'jane' was created, the customer() function within the class was executed. Constructor functions are optional, and often omitted in class definitions. Destructors (the opposite of constructors) will make an appearance at a later stage in the series.

To actually define a function belonging to a class we use a very similar syntax to a usual function definition. The difference is that we have to include which class the function belongs to:

```
class letter
// define class letter
{
char
letter_of_alphabet;
int
number_in_alphabet;
// public components
follow...
public:
void letter(char
letter,int number);
void next(void);
};
// end class definition
letter::letter(char letter,int
number)
// note the :: operator
{
letter_of_alphabet=letter;
number_in_alphabet=number;
}
letter::next(void)
{
letter_of_alphabet++;
if(++number_in_alphabet>26)number_
in_alphabet=26;
}
```

To define a function belonging to a class, we use the class name followed by '::' followed by the function name. This technique is used whether the function is declared as public or private. Functions can (as in C) be defined within the class if that's what you want.

Even after this brief introduction, a very powerful aspect of C++ has been illustrated. This is known as Encapsulation, and along with Polymorphism, Inheritance and Dynamic Binding makes up the four fundamental characteristics of an OOP language.

Initially undeveloped in early OOP languages, encapsulation is a wonderful entity which extends throughout the entire philosophy of OOP. Also known as Information Hiding, it describes how the contents of an object are protected from outside access and influence, unless declared by the programmer. Components of an object can be made private (as we have seen), only accessible from within the class. Data access between objects becomes more orderly, and far easier to change (see Figures Va/Vb).

The remaining characteristics of an object-orientated language are briefly mentioned below, and covered in far greater detail in next month's issue.

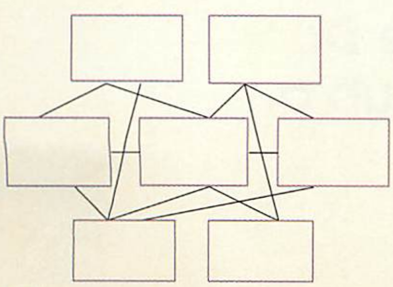


Fig Va: Confusing data access

Polymorphism

Sometimes known as genericity, this feature of OOP allows the use of the same class to serve different data types. A typical example is that of a summation function, which receives an array of values and is required to add the entire array to produce a final total. Polymorphism would allow the same class definition, which added integer values, to also handle floating point values, as well as any other data types as long as provisions has been made.

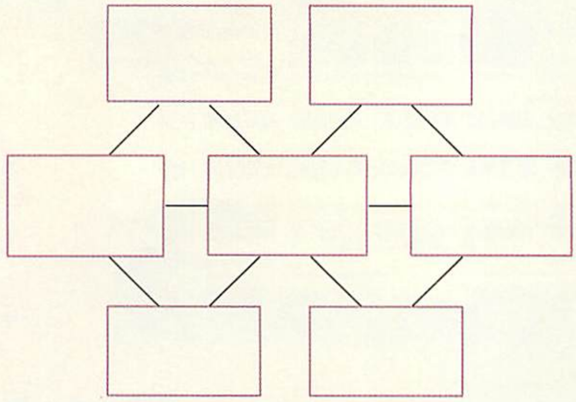


Fig Vb: Distinct data access

Inheritance and more

This is a fundamental property of any OOP language. It is the passing down of information from a base class definition to a new class definition. For example, suppose we were designing a system to handle different clothing in a factory line. We could create a base class, called 'garment'. This class would hold basic properties such as price, materials and size.

However, if we wanted to add more individual elements to the data, for a specific type of clothing such as a t-shirt, then to add them to this base class would mean including long description strings and data types irrelevant to other forms of clothing. A better alternative would be to create a derived class called 't-shirt', which would inherit all the properties of the base class, but also create its very own fields, such as collar type and button type. This passing down of characteristics and specialisation of a class is called Inheritance.

A feature which is hard to implement in a C++ compiler, Dynamic Binding is the ability of a compiler to sense the type of object being accessed or called, and act accordingly. A very powerful and time-saving property of OOP, it is most useful at avoiding potential pitfalls when two or more different types of class are interacting.

Next month

Next month we shall see how these fundamental properties of OOP are implemented in C++. We shall also begin an on-going project which will closely follow the design philosophy described in these articles. END


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The RISC OS 99 SHOW

Post wakefield

Alasdair Bailey takes a look at two new games releases

The Wakefield show has now passed and it's time to take a look at some of the offerings which have been released into my gaming fold – *Final Doom* and *Shovy 3D*. A review of RCI's new *Heroes of Might and Magic II* add-on pack will follow next issue, along with whatever information I can glean from the suppliers present at the show.

Feel free to contact me with information on your games, no matter how big or small, at games@acornuser.com or via the usual editorial address if you prefer snail mail.

Unfortunately, Artex Software were unable to attend the Wakefield show due to commitments with their on-going *Iron Dignity* project. We understand that a number of PC publishers are interested in the project, Psygnosis and Software 2000 included. More details will follow next month.

Final Doom

The *Doom* series goes like this: *Doom* (later re-named *Ultimate Doom*), *Doom II* and then *Final Doom*. *Final Doom* is essentially an extra missions pack for *Doom II*. It contains two additional level files, these are used in place of the main *Doom* level file that was initially supplied with the game. Each level file, or episode, contains 32 individual levels, giving a total of 64 brand new missions in all.

Having been released late in 1995, PlayStation *Doom* was an instant hit on the fledgling console format. id Software followed on from this with *Final Doom*, a collection of levels set to be the final chapter of the *Doom* series.



Nice hand action

Final Doom was released on the PC shortly afterwards and now, as the game makes its Acorn debut, it's time to see what's hot and what's not in the world of *Final Doom*.

The Acorn release of *Final Doom* consists of the original PC CD-ROM containing the level files, along with all the usual Acorn-specific documentation and an installer. You will need a copy of R-Comp's *Doom(+)* or the freeware *DIY Doom* player before you can use these levels, the commercial offering is still available from R-Comp at the address in the box-out below.

Two episodes are included in the *Final Doom* pack, *TNT: Evilution* (sic) and *The Plutonia Experiment*. The episodes are intended to be played in that order so that's the order in which I'll consider them here.

The plot behind *Evilution* tells us that after the monsters were expelled from the world of *Doom II*, another invasion of a military plant was lead by Hell's minions. This resulted in the plant's staff being turned into zombies once more by the forces of evil (*not again! – Ed*) and a population of downright evil monsters being stationed there to keep an eye on them. You, the base commander, happened to be strolling in the desert at the time of the invasion, so when you return you set about ridding the base of its new alien inhabitants.

The levels are very well designed, extra wall and floor textures provide a subtle difference to the earlier official *Doom* episodes. Other than that the graphics are just the same as those found in previous incarnations of this game. The behaviour of weapons and monsters also remain the same, emphasising the point that these are just new levels, the game engine itself remains unchanged.

Unlike many home-made levels available on the Internet and from other sources, these are very playable, and much thought and testing has obviously

gone into their production. It could even be said that these levels are somewhat better than the original *Doom/Doom II* levels. Firstly, they are a lot more challenging, and secondly, a good mix of monsters are thrown at you right from the very beginning.

Evilution's missions also include more puzzle-solving than seen previously in the *Doom* fold. However, the puzzles only really consist of subtly hidden switches, which must be activated to allow progression to the next part of the level, and are still not up to the standard of the mega-puzzles seen in the recently released *Hexen*.

When it comes to playability, *Final Doom* still far surpasses many other titles of its genre. The difficulty level is such that the experienced player will not have to waste time cruising through the initial easy levels intended for those new to the game. With these levels, you can get straight down to work, with some rather challenging monster slaying even taking place in the first five levels.

However, the increased difficulty level does have its downside. From about level 15 onwards, *Evilution* becomes rather tricky, and after about level 20 it's just evil. That aside, the first 14 levels are, for the most part, a joy to play and will be a challenge even if you are already a master at *Doom II*.

The second episode, *Plutonia*, is harder than anything I've ever seen this side of hard-town. If the last few levels of *Evilution* were evil, the task of completing *Plutonia* could be equated to the chances of donning Ripley's shoes and surviving all three *Aliens* sequels. It really is that hard, even your flame-retardant games writer had to resort to low-life cheats to get very far past level five.

The last level is absolutely packed full of the biggest and best baddies around. That, I would say, is this episode's major failing point. It is insanely difficult and unless you're a pro, it's not worth even trying to complete *Plutonia*.

As with *Evilution*, *Plutonia* includes a few new graphics, but there's nothing really stunning in there. If you're looking for excellent graphics in a game of this kind, you'll need to buy a PC and play *Half-Life* or *Quake II*. However, if good, solid gameplay is more your scene, you can't go far wrong with the *Final Doom* pack.

Pricewise, at £15, the pack is well worth the cash given the amount of time you're likely to spend playing it. However, the price has yet to be confirmed, so although the final price will not be higher than £15, it could well be lower. It is worth pointing out that *Final Doom* may be obtained on GT's *Replay* label for the price of £9.99 from many High Street retailers, including the Electronics Boutique. The game will still function in the same way, but you won't benefit from Acorn-specific technical support or gain peace of mind from knowing you've supported the Acorn market.

To summarise, if you enjoyed *Doom (II)* and haven't played it in a while, go out and buy *Final Doom* now. However, if you're looking for something more technically complex from this genre, grab a copy of the *Heretic* and *Hexen* double pack or wait for *Quake*. END

Product details

Product:	Final Doom
Price:	£15.00
Supplier:	R-Comp Interactive, 22 Robert Moffat, High Legh, Knutsford, Cheshire WA16 6PS
Tel:	01925 755 043
Fax:	01925 757 377
E-mail:	rci@rcomp.co.uk
WWW:	http://www.rcomp.co.uk/



Oh, Mr Editor, what have I done to you?



Nice doggy...

Shovy 3D

Under their new management at CJE Micros, The Fourth Dimension have released a handful of new titles. Up to now none have really been worth the trouble of buying, but *Shovy 3D* is billed as the first of a new run of high-quality releases.

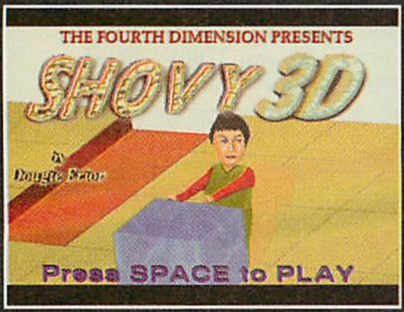
Shovy 3D is a puzzle-solving game where you must guide your character around a large playing area and sort coloured blocks into groups of three in order to make them disappear. The game does have the term 3D in its title but that must be an attempt to make it sound good since the game is not truly 3D, it features a flat playing area which is viewed at an angle.

A variety of different blocks are scattered around each level and these must be pushed around the playing area to form groups of three by type which are promptly removed in a tetris-like fashion. The aim is of course to clear the playing area of blocks in order to progress to the next level.

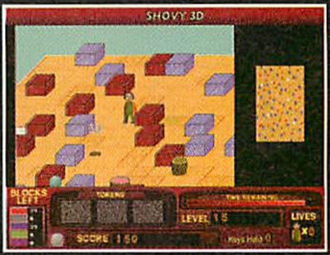
Your character, named Pushy, but not related to the small blobby character in Fred William's *Pushy* and *Pushy II*, wanders about the board and is able to carry out a number of vital tasks.

First and foremost is his ability to push blocks around, without this skill, he would be pretty useless. Secondly, he is able to throw a large blue ball at the opposition, knocking them to the ground. Finally, he is able to dance in the fashion of Mr Bean. This skill may be observed once the player becomes so bored he/she hammers the push key and watches pushy move back and forth without any block to shift.

Shovy's main failing point is that the pace of the gameplay is lethargic to say the least. The motion of the character from square to square is rather sudden and disjointed. Add to that the fact that the game lacks any real moments of excitement and you have a pretty dull game on your hands.



The brain-teasing element of *Shovy* does deserve some praise though. Once style and first impressions are put aside, the actual gameplay is fairly good. There are three main types of block available; the ordinary ones which will move one square when pushed, the green ones which will continue to move until they hit an obstacle and then the blue variety which will bounce off walls to come back and hit you unless you keep your wits about you.



Blocks must be sorted by colour, and the specific properties of each block mean that the basic blocks must be used to guide the more awkward types into position. This adds a strong puzzle-solving element and this alone will keep many people who take up the challenge playing for hours, just trying different ways of getting the blocks to meet.

The nasties which bar your way may be killed in two ways. Pushy may launch his big ball at them or he can flatten them with a block. The ball must be retrieved after it has been used since Pushy only has one ball and must look after it carefully. This twist does add something to the game, and perhaps offers something over and above endlessly collecting ammunition.

A time limit is included in each level, but this doesn't really alter the gameplay in any major way because the limits are generous, so you're more likely to have fouled up in some other way before your time expires. However, it is sometimes fun to wait for the time to run out because a nasty creature appears and chases you around the level until you're dead.

When it comes to graphics, *Shovy* hardly excels in any area. The title screen is well drawn and the menu is pleasing to look at, but the in-game graphics lack a certain something. Even in the high-resolution mode, the character is rather pixellated, although the blocks and playing area textures are acceptable.

In these days of high-powered Risc PCs and StrongARM processors, even puzzle games should feature nicely drawn graphics. The freeware *Pushy II* from FishNet is a spookily similar game, it offers very well drawn 24-bit graphics for machines which can handle them and fewer colours for those that can't.

The sound effects aren't much to write home about either. Only a limited number are provided, and although there are some amusing voice samples, they just don't go far enough. The main music track sounds similar to the tracker module music which accompanied oh-so-many pre-Risc PC graphical demos. Perhaps this sort of music will appeal to some, but it's sure to annoy the pants off others.

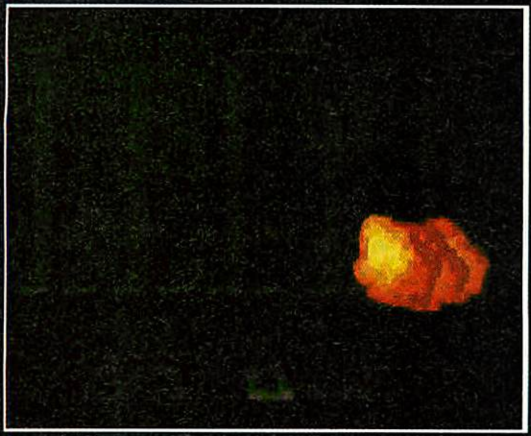
When launched, the game provides an iconbar icon which serves no further purpose than to get you into the actual game. Upon clicking on this icon, you are presented with a choice of screen modes to run the game in. The low resolution option allows the game to function on machines as lowly as a 4MB ARM3, with the 'Mode 28' option only being suited to Risc PCs with VRAM. There is a minor apostrophe error in this dialogue box, my Risc PC does not own VRAM, I do, and I'm sure that's the case with most other users.

Overall, *Shovy 3D* is a playable game which lacks style. Ardent puzzle solvers should buy this game but be warned, you'll need to force yourself to play through the first few levels before really getting into the swing of things.

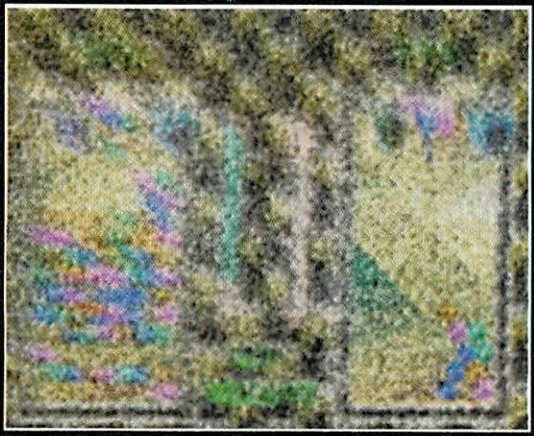
Product details

Product:	Shovy 3D
Price:	£20.00
Supplier:	The Fourth Dimension, 78 Brighton Road, Worthing, West Sussex. BN11 2EN
Tel:	01903 213361
Fax:	01903 523679
E-mail:	4d@cje.co.uk
WWW:	http://www.cje.co.uk/4d/

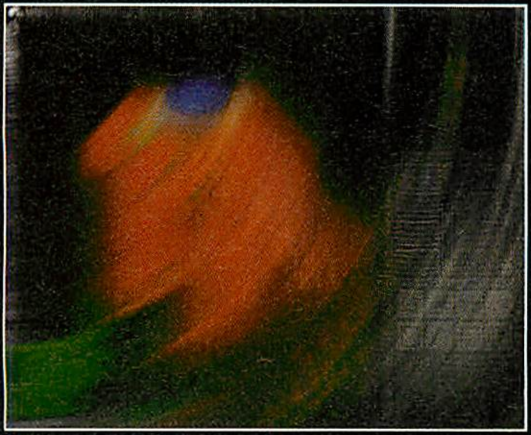
Guess the Game



Screenshot 1



Screenshot 2



Screenshot 3



Screenshot 4

Oh dear, that darned PC has mangled all my lovely Acorn screenshots again! So, boys and girls, take a long, hard look at them and let me know which game corresponds to which bodged screenshot. But hurry, there's five copies of *Shovy 3D* from The Fourth Dimension up for grabs for the first five correct entries out of the hat.

Once you've made your selections, complete the entry coupon below and mail it to the usual editorial address marked 'Guess The Game' to arrive not later than 19th of July.

Alternatively you can e-mail entries to me at games@acornuser.com giving all the information asked for in the coupon including your full postal address. Thanks go out to David Bradforth, *Shovy's* manager for donating the prizes.

To make life a little easier, here's a list of games to choose the four correct answers from:

1. Heroes of Might and Magic II
2. Syndicate
3. Dune II
4. Sim City 2000
5. Bubble Impact
6. BotKiller II
7. TEK
8. Abuse
9. Xenocide
10. Super Foul Egg

ENTRY FORM

Complete this form and return it to *Guess the Game, Tau Press Ltd, Media House, Adlington Park, Macclesfield, SK10 4NP.* E-mail entries should be sent to games@acornuser.com

Name ....

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....

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Screenshot 1 is..........

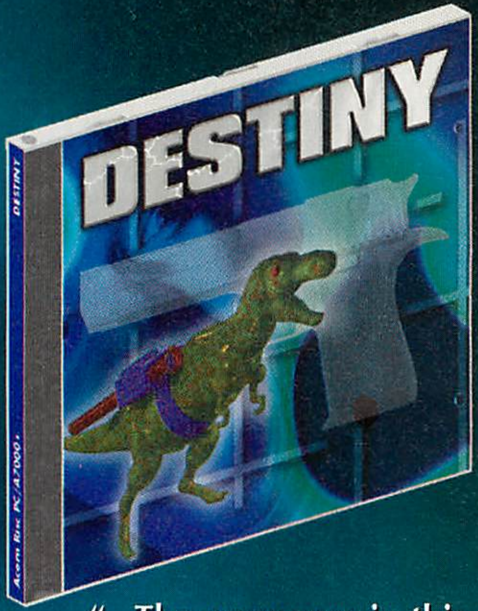
Screenshot 2 is..........

Screenshot 3 is..........

Screenshot 4 is..........

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*Star info

*Dave and Dave reflect on 101 *Infos*

FOR i = 108 TO 209

This being the last ever *INFO, we thought we'd take our usual space to revisit some classics of the last nine years and pay respect to the real stars of this column – our readers and contributors. We've spent the morning delving through our drawers and then had a quick look through the stack of back issues in a dim and distant, dank and dusty corner of the *INFO orifice.

From the grand total of 321,946 words and 2,133 programs we've teased out a final selection of a couple of thousand words and our 60 or so favourite doodly doodles. As this is the final column we though it would be appropriate if I (DL) use the left hand side of the keyboard and DA takes the right. He's also in charge of the punctuation and I've been lumbered with the numbers and the function keys. Presses of the space bar will be decided by the roll of the official *INFO dice.

Most of the programs mentioned here can be found on the cover disc and also on Ceefax page 812.

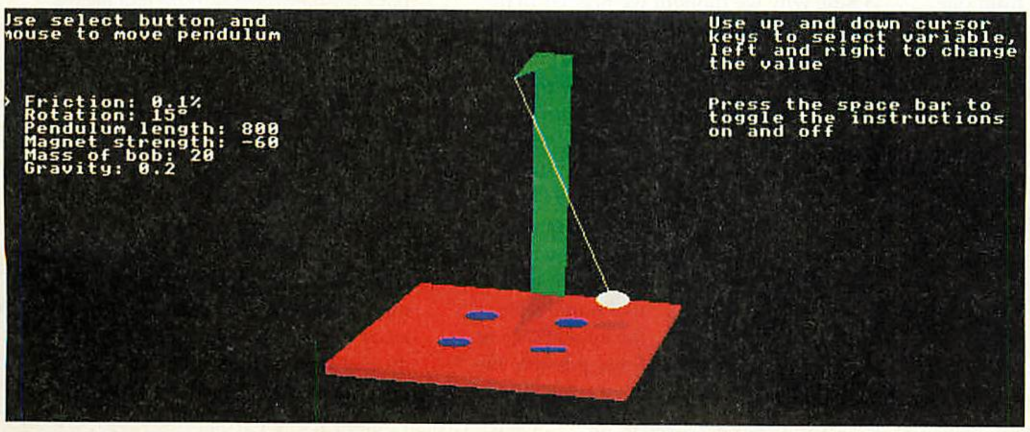
1991 – Star-t info

July, and the first *INFO. **Michael Attenborough** kicked us off with a 3D lissajoux generator – SINs, COSs and a healthy blob of machine code. We also covered sorting techniques and the first obscure game. A fine demonstration of what we wanted in our new column.

August brought us random landscapes (see *Coast*), wavy scrolls (scrolly waves didn't appear for another four years) and star commands. 80MB hard disc? £399!

On to October and **Michael A** became one of our first regulars with *Pendulum*, starting a trend for simulating the behaviour of physical objects: magnets on strings, balls on strings, strings on strings. In fact an amazing assortment of stringy things have appeared over the years. The rumours of A New Operating System – RISC OS 3 promised us a healthy future.

The A5000 first appeared in November and we responded with **James Wilkinson's** stream of *Bubbles* and **Michael Fairbank**'s Jet Set Willy-esque *Rope*. Neither of which required the sheer brute force of a 25MHz ARM3.



1992 – On a ROL

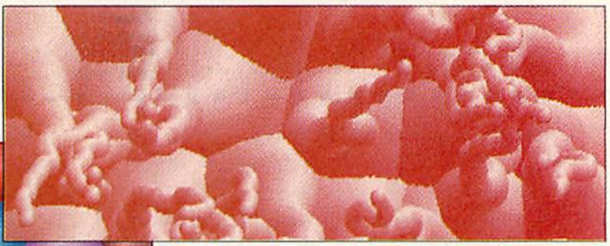
Our naturist theme continued with the seminal work *BlindFlies* by **Barry Wickett** – a mainstay of our early years. This classic program was subsequently lambasted for being 'too silly!'. Can you believe that? In the same issue **Daniel Tray** gave us *ArmTree*. Even on one of those new fangled A5000s this was sluggish. However coming back to it now with the benefit of 9.32 times as many megahertz and it positively rockets along – as much as a tree can rocket.

The inspiration for a later challenge came from the February issue in the nebulous shape of a cloud generator. The original idea by **Andrew Jones** triggered a gentle trickle of weathery items. Sun, rain, sleet and snow have all fallen on our pages. Except sleet.

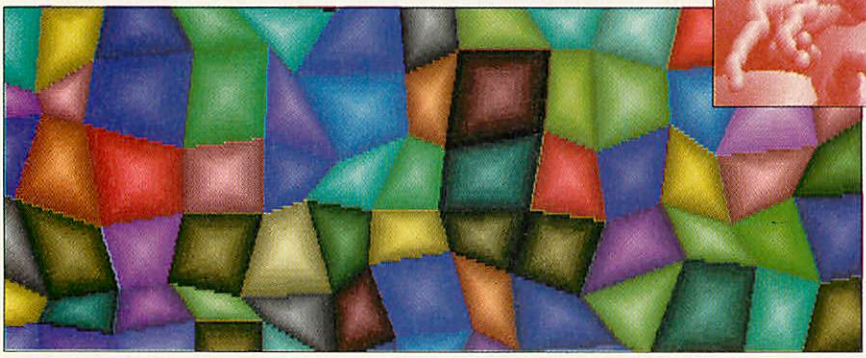
'Animated hedgehog land' proclaimed the caption under our next choice, although 'aerial view of Madonna's lingerie production line' would have been far clearer. *Spikes* fit nicely into our bizarrely popular category of eye/brain discomfort, but what could you expect from our resident Dane, **Jan Vibe**. Jan has stuck with us from the beginning despite the many occasions we've accidentally told everyone he's Dutch.

From April to September the pace really began to pick up – Jan provided us with a psychedelic eiderdown and, incidentally, a program to generate a coloured grid of squares called *Toner27*. We were back to trigonometry in May with a one-liner *TrigProg* from **David** and **Andrew Jefferies** (whose names are actually longer the program). One-liners were a wonderful challenge back then, their point having been somewhat lost in these days of Javascript and Megabytes.

Jan continued to reveal his obsession with Madonna's, err, unmentionables somehow bridging the gap between the bizarre and the mildly obscene with an unpleasantly pink offering called *Weirdo*. **Michel Grimminck** made *Waves* as did the appearance of the A4 portable. More physical shenanigans were demonstrated by **Bryan Creer** (who definitely did not have a mouth like an ear). His *WaterWheel* showed us all just how unpredictable a wheel full of buckets could be when placed under a dripping tap. Having settled this once and for all we able to close the year with 'The most disgusting picture you've ever seen on a computer screen'. Seven years on, and Jan's tentacles are still quite a sight to behold.



Weirdo



Jan Vibe's bedspread

1993 – One liners and three dimensions

Guess who? Jan's **Stars** burst onto our screens in February with a cunning use of the draw module to simplify the plotting. May brought the first Tesco Computers for Schools offer (Does anyone remember the rolling demos running in the shops? I wonder who wrote them then...) and for some reason the news pages showed Sarah Green in a glass box. On the *INFO pages you could find programs from our second most famous Jan V – **Jan Vlietinck** (but possibly our most famous - inck) – *Snake* plotted recursive hexagons in a three dimensional lissajoux shaped snake. *Top* drew a top, albeit one with 2400 polygons.

June marked the peak of one-line-mania – *Bell7/1* showed it *was* possible to squeeze **Nigel Thomas'** 380-line campanology simulator into 255 bytes. Quite why we thought we needed to do this is a different matter entirely! How **Robbie Davies** fitted the three voice *Tune/1* into the same space was a mystery back in '93 and six years later we're none the wiser! We had to wait two months for the appearance of *Fruit*, possibly the most cunning one line game ever. It used the RAM disc to create three files of different types representing a fruit machine. It then saved itself with a different name indicating how much money you had left! Marvellous.



Stars

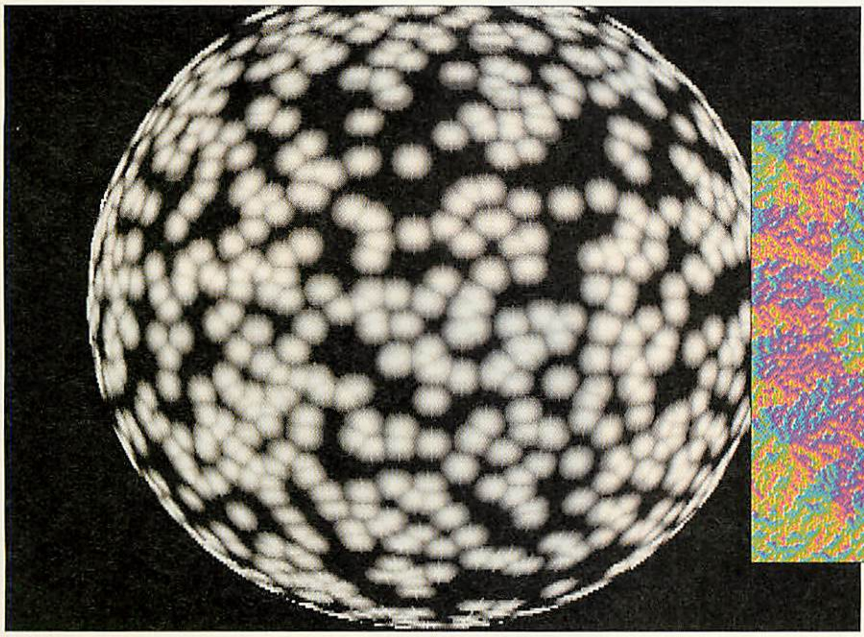
Allister Jenks added a well-needed breath of New Age topicality to the one-liner genre with *CropCircle*. So convincing even Patrick Moore might have been impressed if he had been a farmer. More Jan in November with *Shatter2*. The 3D fad of the year was Magic Eye pictures, there are certain parties among the *INFO office who are convinced that these are just another hoax perpetrated by rustic farm hands. Unbowed by the shrieks of 'Oo look – an owl!' said parties remain forever sceptical. **Bryan Creer** proved that these images could be just as elusive, illusive (and quite probably allusive as well) on screen as on paper. The year ended just as disgustingly as the last with an eyeful of the Dutch, sorry, Danish intestinal tract in the shape of *GutsVGA*.

1994 – birth of the Risc PC

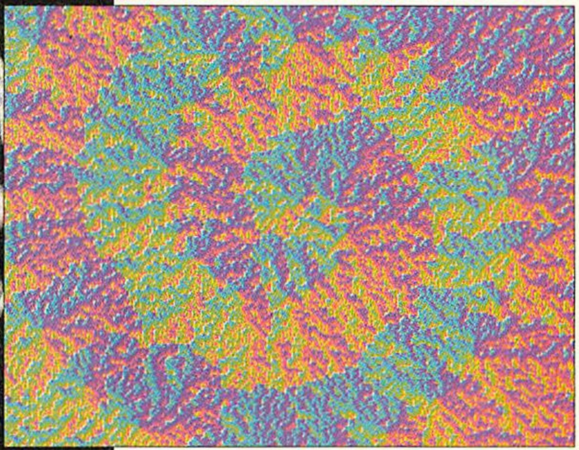
Acorn's speediest creation yet appeared in May '94 but it took a little while for people to start making full use of it's potential. Jan Vibe's tentacles started sprouting a good deal faster, but that may have just been due to a particularly warm spell in June.

Another long-running *INFO tradition was born in the shape of the MUSC (Most Useless System Call) of the month, where readers nominated contenders for the most pointless SWI ever created, only for other readers to write in the next month with examples of how gloriously useful it was after all.

Another name that was to feature prominently over the years to come was **Jean Van Mourik** – who had clearly tried hard to distinguish himself from our other regulars by taking an 'e' (into his forename). Clearly on a mission to brighten the screens of Dyfed, he flooded our screens in August with the psychedelic *Whirl* and followed through with the eerie, rocky globe of *Spheragate*. The mineral theme was picked up by **Andy Jefferies** in September with the cryptically entitled *Rock*. Jean brought the year to a graphical crescendo with *Candied*, a curious doodle that produced obscure candy-like mountains.



Spheragate



Whirl

1995 – Pearls and Pasta

Your £399 would now buy you 540Mb of hard disc, compared to the feeble 80 when *INFO first opened its doors.

February saw the first issue of *Acorn User* completely produced on Acorn hardware and in it, the writers were asked to make their predictions for the future. We predicted that Jan Vibe would become president of Denmark and replace the single Danish flag with 256 flags of slightly differing hues to be raised and lowered at 1/50 second intervals.

We continued to supercharge past masterpieces for the Risc PC, providing a 256 colour version of Jan Vibe's *Pearls* in the March issue. It was joined by a remarkable (well, for early '95) real-time fractal landscape from **Alistair Turnbull**, showing the shape of things to come. (If there were a lot of fractally, fjord-shaped things expected that is.)

April's issue sported a CD-Rom for the first time on which, among many other delights, all your past *INFO classics could be found. And in July, the first murmurings of the superchip known as StrongARM could be heard. Would we ever be able to control Jan's tentacles again we wondered?

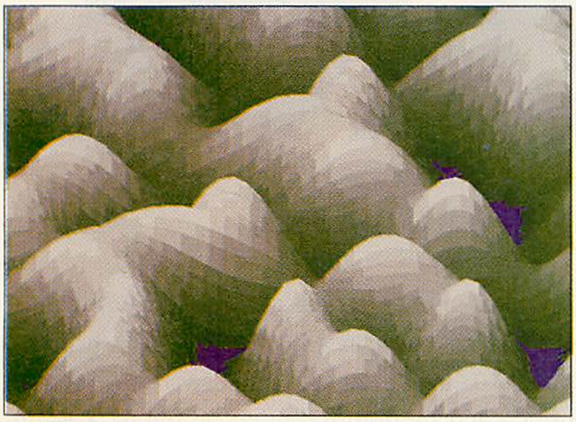
Inspired by the Jan's, October saw the technicolour pasta-based demo known as *Taglia*. And then, just when I (DA) had thought we'd seen the last of those stupid 3D pictures (you know, the ones where there isn't anything there, but some people just pretend they can see an owl or something and go on about how great it is) Mr V himself chimes in with *Wood* – a deceptive program that at first glance looked like a "BBC Welcome Tape reject", but which cunningly held "magic-eye" secrets. Well, so he says anyway.



Taglia

1996 – In the blink of an Acorn

Just when we thought the days of the home-programmer, doodling away, were finally coming to an end as everyone switched to Windoze and forgot about one-line games and lissajous figures, our readers rallied and provided a yearful of gems. In April, Jan Vibe produced the rather frogspawnesque *V_Tile+* and the, erm, mountainesque, *Mountains*. In the same issue, perhaps the cutest and most understated of desktop sillies arrived in the shape of *!Blink* by **Andrew Ayre**. Updated with a few more expressions some months later, the catnapping Acorn still brings a smile to our wizened, timeworn phizzogs.



Mountains

The recurring theme of the bizarre game, well, kind of recurred I suppose, as May provided the world's first computer version of the Viking game of *Hneftafl*. (We suspect that the inventor of this game wasn't a Viking but simply sneezed just as he was about to answer his friend's question "what do you call this 'ere game then Eric?".

The *INFO pin-up, a relatively scantily clad young vixen who had come to be known as Jenny, came in for one last round of abuse. Having previously been spun, zoomed, shrunk and generally knocked about, she was finally squished beyond recognition by Alistair Turnbull. Alistair returned to the less brutal world of fractals in the November issue with *CX(1-X)*, and **David Llewellyn-Jones** accompanied him with *Lights*. At the time we said "if Monet had ever gone into the fireworks business..." November was a cracking issue all round, not least because it featured our favourite Digital Symphony track of all time – **Graeme Jefferis'** *60sSciFi*. A mere 30K or so, this was one of the most original compositions we ever received.

That old chestnut, the Sierpinski Gasket, took one last trip round the block, with the customary bit of *INFO wibbling by Alistair Turnbull. We wonder if Mr Sierpinski ever guessed what people might end up doing to his lovely gasket?

1997 – World Wide Wodgamacallit

The year everything seemed to go "global". The NetStation was unveiled and it seemed nearly every *Acorn User* cover was about webby things in general. And of course, in line with the Internet explosion, our loyal band of contributors radically changed direction. For example, in January we carried **Nigel Stoner**'s *Rain* and *Snow* doodles. And a cloud generator from **Daniel Mossop**. Hmm. Well, if it ain't broke, why fix it?

Daniel also came up with a prog called *ATractor* which you would be forgiven for thinking was a revamp of our earlier crop-circle simulators. Not so – it was one of those unusual and attractive fractal numbers for which we are famed. Not one of the gaudy, multi-coloured bouncing ones, but one of the ones that looks like it's been drawn by someone with a Spirograph extra-deluxe and a bucket of sharp pencils.

Our almost-regular challenges have provided much entertainment over the years. The basic premise is you pick an unusually difficult programming task, impose a whole set of largely random and generally quite unreasonable restrictions and wait and see what people come up with.

The Circle challenge was particular rewarding and *Pulse* by **Rob Jeffs** won a well-deserved first prize with it's endless and rather unpleasant throbbing, all done with circles of course. The other great thing about our challenges was their never-endingness. Most months we would receive a "late-arrival" in the cloud or tunnel category.

March saw the arrival of perhaps the most frighteningly realistic simulator of all – *Journey* by **Nigel Stoner** depicted so accurately the view from a speeding train's window that you could almost taste the watery coffee and limp danish pastry from the virtual buffet car. It was accompanied by the home-grown *Writhe* – perhaps the last in the long series of tentacle-like demos first started by Jan.

Writing 3D games was the theme of the April cover, but in *INFO our policy towards such frivolous pastimes has always been "make 'em small, or make 'em strange". Nigel Stoner went for small with a complete Golf game in just 1K. This seemed to be the logical successor to the one-line game of old. How refreshing that while commercial game producers were wondering how to fit their creations onto a CD, our readers could fit 1600 on a single floppy.

The Vibe effect continued to be evident in June, with **Philip Mellor**'s *Craters*. The shaded ball seems to be a stock cupboard essential of the graphical doodler and it's amazing what you can do with a couple of spheres at a push.

Pushing the boundaries of the StrongARM was **Jan Vlietinck**, with the fastest Mandelbrot plotter we had ever seen. Making use of the brand new 64-bit multiplication instruction (which was probably added to the chip just for Mandelbrot calculation).

August would probably have been the month we'd have finally kicked our habit for 1K Basic versions of obscure old games that everyone had forgotten about anyway. Well, we would have done had **Andrew Clover** not provided a splendid 1K Basic version of that classic *DeathChase*. If you've ever been trapped in a spacious meadow at dusk in which there are an inordinately large number of postboxes... Well, you know the patter by now.

Two long-running themes – the tunnel and the utterly revolting were neatly combined in December by **David Llewelyn-Jones** in the anatomical shape of *Oesophagus*. This was an all-too-real emulator of one of those cameras that goes down (or indeed up) the parts where other emulators fear to get their toes brown. On a slightly more savoury note, we offered *Twine* – another demo from the Spirograph college of sharp pencilship.

And the year was brought to a seasonal close with Jan Vibe's *Sand* (well, seasonal if you're Australian and spend Christmas on the beach). This classic vibism allowed you to write message in virtual sand without risking your toes to the hazards of passing crustaceans.

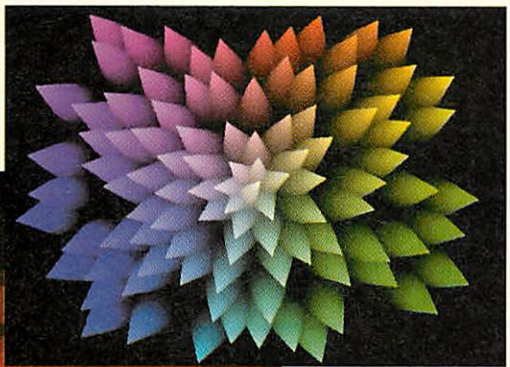
1998 – Phoebe or not Phoebe

Rumours of The Next Machine raged backwards and forwards throughout the year. Now, of course, we know that the poor old Phoebe was never to see the light of day, but during 1998 the promise of another hike in machine spec kept us poised. In the middle of a particularly pretty January column, **Brian Cooke** impressed us with a colourful spiky-leafed plant, *HSVpetals*. A nice demonstration of colour selection using that trusty *INFO SWI *ColourTrans_ConvertHSVToRGB*.

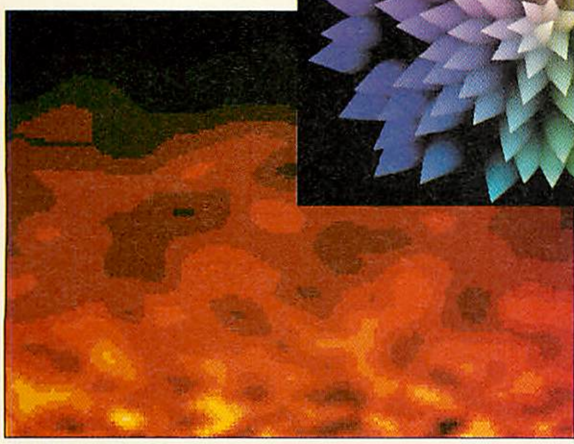
With hindsight, last August's speculative 'last 1K game' was clearly premature at this point as we featured a magnificent version of the all-time classic Space Invaders. **Martin Allcorn** performed the conversion from the original 8K of Z80 code to 1K of BBC Basic. In ten years time are magazines going to be astounded by 1 DVD games?

There wasn't any smoke on the water in the March issue, but there was fire in the sky. An awful pun on warp speed (we'll leave you to dig out the issue) led us into **Dennis Ranke's** *FireMC*. A truly tiny piece of graphical doodlery that simulates a wall of fire in a mere 256 bytes, less is definitely more! April escaped without an april fool for once, so on to May and (oh no surely not) another lissajoux. We liked **Nigel Stoner's** contribution to the genre because his 3D render of the classic triggy wiggle looked genuinely 3D without the need for glasses, crossed eyes or major surgery.

Regular **Mark Adcock** adorned out monitors with some fading routines in August. A bunch of circles could be made to fade out fast, slow, or in our choice here 'slower'. What they were faster or slower than was never revealed, but *SlowerFade* gave the nicest effect. C-programmers will be well aware of the 'static void'. It is quite possible that **Stu Smith's** *URHere* was a representation of it, but that's obviously not the case as there's a small green arrow pointing to Where U R!



HSVpetals

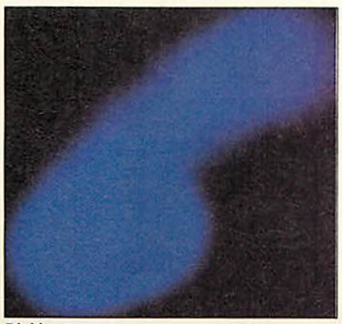


FireMC

November brought us the 200th issue and a crude but convincing roller coaster simulator from **Thomas Madams**. It didn't conjure up the terror of the creepy Don't Look Down man at Alton Towers – possibly more like driving in a Morris Minor down the B4590. But then driving a Morris Minor down the B4590 at 120mph can be quite scary.

1999 – We've come a long way baby

To round things off, we've chosen **Graham Brooker's** *Dorian* and **David Gamble's** *Blobby*. These seem to sum up very nicely many of the 'strands' running through *INFO over the years. *Blobby* was a colourful, blobby, doodle making use of colour cycling, fading, circles and organic properties and *Dorian* took an idea from a couple of years back (*Expound* – the recursive sentence expander) and used it to produce an entirely unexpected result – a Dorian chant!



Blobby

*Bye

We'd like to thank everyone who has contributed to making *INFO the success that it was. In this potted history we've only managed to cover a tiny proportion of the 2000+ programs we've carried over the last 100 issues. In addition to those here we'd also like to add our special thanks to a few more of our most prolific authors: old crochet-face himself Mr. Adamson, his huge repertoire of MIDI files has kept us entertained for many an issue; Alain Brobecker for an eclectic range of bells and whistles and the utility wizard himself Justin Fletcher – it's no surprise he's now deeply embedded in RISC OS Ltd.

We have one final task – to present the *INFO award for Outstanding Contributions to the World of Doodles and Other Useless Graphical Nonsense. There can be no doubt that this most prestigious of honours must surely go to Mr Doodle himself, Jan Vibe, who will receive a certificate and a free lifetime subscription to *Acorn User*. Thanks Jan, thanks everyone, it's been our pleasure. Keep doodling!

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- RPC700 For Sale: 2Mb VRAM, 24Mb RAM, 1.6Gb HD, DX2/66 PC Card, 4xCD-ROM, TechWriter Pro. Also Iiyama Vision Master Pro 17" (9017E). All offers considered, tel: 07970 219523
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- A5000 for Sale. 14" Acorn colour monitor, 4Mb RAM 40Mb HD with extra hard drive fitting kit inside. Lots of games and tons of other software. Also Panasonic matrix printer included. Offers between £200-300 please. E-mail: laura@duffy1.demon.co.uk
- Bits for sale: DX4-100 PC-Card with DOS, as supplied with Risc PCs, and in original packages. Artworks CD(v1.7) with complete set of manuals and also the Tekkie-Disc. Tel: Karl on 01703 676317 or e-mail ksharman@soton.ac.uk with any reasonable offer.
- A4000, 4Mb, 80Mb, monitor, manuals, cables, original boxes and discs. Can be shipped, currently in north Wiltshire. £250 E-mail: artlute@argonet.co.uk
- 4Mb RAM kits for A3020 for sale £15 each. Also other A3020 parts, including keyboards, cases, etc. Tel: 01953 681 684 for more details
- Epson stylus 600 with s/ware and Funpack, plus new black refill. £100. Tel: 01304 614 557 or e-mail: stevetaylor70@hotmail.com

The great protector

Cambridge Software House (01487 741223) followed their superb *Frontier 2000* with CD-ROMs on *Burns* and *King Arthur*, their new historical excursion gives us the life and times



of *Oliver Cromwell*. Produced in conjunction with the Cromwell Museum, it follows the familiar *quests* route with over twenty adventures to play. Following probably the most turbulent years of British history, 1599 to 1658, the CD-ROM ranges across the British Isles and features cameos on over 100 people.

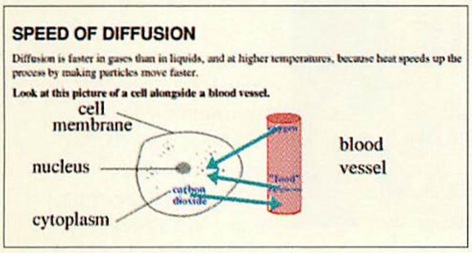
You also get a fascinating insight into life in the 16th century, supported by original source material such as Cromwell's letters and speeches, over 800 annotated pictures, and information on over 300 places.

Produced to coincide with the 400th anniversary of Cromwell's birth, CSH promise an interactive journey for schools looking for History or Literary Hour resources all for £49.95.

Biology knowhow

If you're looking for inspiration for your own web pages then take a look at http://websites.ntl.com/~webwise/spinneret/

All produced on a Risc PC this provides teachers, students and parents with a series of worksheets and teaching notes, supporting



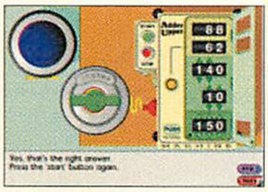
GCSE Biology at Dual Award and Separate Science levels.

At the moment they constitute nearly a full set of learning/teaching resources, together with 'ideal' answers. They are mostly aimed at candidates for the Edexcel syllabuses and are especially informative in the area of extension material, but they will probably be useful with most GCSE Dual Award syllabuses.

Creator, Dr Richard Steane, has the content in place and is now working on putting some polish to the pages. If you enjoyed the children's exam quotes in last issue then look at the *howlers* section.

More news on NumberWorks

More news from Sherston (01666 843200) on *Number Works*. Featured in the March issue of *Acorn User* the final touches have now all been put in placed.



Aimed at Years 3 and 4 it is set in an old factory. A wide variety of activities are provided to complement as much of the maths curriculum as possible. You can jump straight to these or enter specific ones via the menu.

The adventure asks children to mend the cranky old machines found on three different floors of this neglected factory. These machines have been designed to teach, practice and consolidate many of the numeracy skills required by the National Numeracy Framework.

On the ground floor all the machines deal with the number system and place value. One floor up and you're looking at relationships between numbers and computation, while in the attic, machines deal with solving numerical problems. All activities have three levels of difficulty so that children can work at a level relevant to their individual needs and can progress through the levels as their knowledge and understanding develops. The CD-ROM is priced at £49.95.

In brief

Wet and webby

PUPILS from Bignold Middle School in Norwich took part in a field trip to Wicken Fen Nature Reserve in Cambridgeshire in May and linked up – via the Internet and AngliaCampus – with over 20 schools across the UK.

Britain's oldest nature reserve, Wicken Fen is celebrating its centenary this year. The pupils took part in a range of investigations and experiments and reported their findings in history, geology and wildlife habitats to other classes as well as providing information for an online version of the visitor's guide.

For more information contact AngliaCampus on 01603 284104 or visit the free trial site on: www.angliacampus.com

Honey monsters

NEW research the the Economic and Social Research Council suggests that boys are not inherently better at using computers than girls but rather 'male' qualities of the software negatively influences girl's performance.

The research was undertaken by a team from the Open University, Bournemouth University and the University of Hertfordshire and led to a series of tasks being set for 120 school pupils aged between 11 and 12-years old. All were used to working with problem-solving software but this time one of the tasks involved the children being given two computer-based adventure games. One featured kings, pirates, ships and planes and the boys performed better. Yet when the heroes become teddy bears the girls did slightly better than boys. When actual responses were tested it seemed that the boys reacted the same whatever the character.

Further tests showed that girls did better when not working alongside the boys. Commenting on the results, Dr Karen Littleton of the Open University said: 'We think that performance is a by-product of gendered expectations about computer-related abilities. If girls expect boys are going to be better with computers, or if boys think they should perform better than girls, in the absence of any interaction, the expectations may become self-fulfilling prophesies.'

Contacting Me

You can contact the Education page by e-mailing me, Pam Turnbull at educ@acornuser.com

Maths is multiplying

Pam Turnbull sees how a new package can help make learning tables less of a chore for everyone

Built around the BBC TV broadcasts, you don't have to watch them to use this CD-ROM successfully. As well as great graphics it provides reinforcement and extension ideas to help children learn multiplication facts up to 10 x 10. But this is all wrapped up in an adventure format with activities in each room complete with support, advice and suggested learning strategies.

Your adventure starts in the courtyard with nine numbered and padlocked doors. These are numbered 2 to 10 and you start by being given the choice of golden keys to 2, 5 and 10. Choose these in any order and you'll find yourself in the Wizard's Room, Orchard or Treasury working with multiples of 2, 5 and 10 respectively.

Enter room 2 and the Wizard asks you to match the correct creature who (when multiplied by 2) will give the same answer as one of the shuttered windows. Release all the creatures and a dungeon grid appears. Click here and you're taken to a *speed test* of randomly selected questions taken from the rooms you've visited so far. Success rewards you with a password to allow you deeper into the castle.



Teachers can use these passwords (helpfully supplied in the manual) to select appropriate tables for children. So, if on the start up screen you entered *wall* you'd find that the game would assume that you have completed the 2 and 10 times tables at the first level and were going to play with the x5 tables next.

Each game comes with the Jester. Click on him and a screen of written instructions will appear on how to play the game. Sitting next to the Jester is Digit the cat who'll provide, help, advice and information on the maths being used. This is very useful, but more speech and investigations rather than plain telling would have been better. Indeed this is the major sticking point of this program, more speech and less text please.

At the next level you're working on the 3 and 4 times tables which takes you to the dining room where the king and friends are seated at a round table. Your task is to find the total amount of food needed so that each person has a plate with three pieces of food. This is done by clicking on the monarch to reveal a x3 table fact, complete the ? and a number grid, from where you must drag the correct answer, arrives. Meanwhile, in the kitchen, no food will be forthcoming unless you match the x4 table fact to a range of numbered bottles and cartons on the kitchen shelf.

Moving on again and you're looking at the 6 and 9 times tables in the Beehive and Ballroom. In particular, you must click the bees to wake the correct number to fill the honeycombs, or manoeuvre the King and Queen to the squares which are multiples of 9.

The final level reveals the 7 and 8 times tables at the Pond where you must tread only on multiples of 7 which have been muddled up. Or how about freeing the queen from the maze with your knowledge of x8 table facts. At the bottom of each page in the manual are teaching pointers such as one on commutative law.

This is a nicely put together package but it doesn't have the appeal of Sherston's *Table Aliens* for my class of testers. The graphics are lovely, the sound effects minimal, while speech is even worse. However the content and learning strategies are excellent. There is good control over the mouse options and over the level children are working at, for teachers (or parents), but the repetitive nature of the activities will appeal to some children more than others. **END**

Product details

Product:	MegaMaths Tables
Ages:	5+
Price:	£39
Supplier:	Logotron, 124 Cambridge Science Park, Milton Road, Cambridge CB4 0ZS, UK
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Fax:	(+44/0) 1223 425349
Web:	www.logo.com
E-mail:	info@logo.com

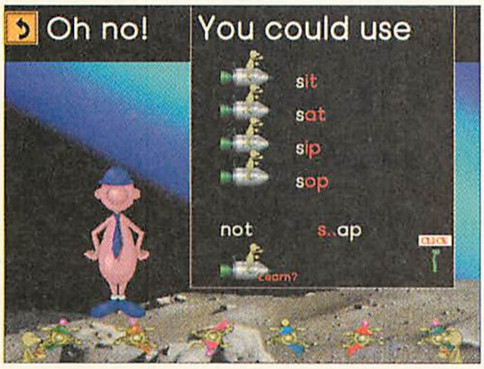
i before e except after c

Improve your spelling with a new fun range of activities. Pam Turnbull reports

This collection of six educational games uses the excellent graphics Resource has adopted since the launch of *Rainbow's Edge* and they really appeal to this age range. Starting with *Balloons*, you must match a beginning to an ending to make a word.

A simple activity which is useful whether you're working on onsets and rime or suffixes. The teacher can use the provided lists or very easily set up her own. You need to choose three lists to use in the game via the options screen along with setting the number of tries a child can have – from 3 to 25. The game displays a consonant cluster or single letter at the top of the screen with various word endings floating around on balloons.

Children must then click on the balloon which makes a word. This is then spoken and then they're off looking for a new word. If they choose an incorrect ending, the word is spoken but that balloon then bursts progressively cutting down on the options as they go. However, a list of correct words is also spoken and displayed. You can add words to the built-in dictionary with a simple key combination but I think this information is best left with the teacher! Check out the options and set-up before you let the children loose.



The Race is an animated version of Look Say Cover Write Check which took a little getting used to, but you can have words presented as letters (dislike) or word parts (dis-like) and if your chosen list is using words of less than four letters it will be spelled out letter by letter using letter names or sounds – you choose.

Alternatively, *Ladders* has real game feel to it as you must manoeuvre your character up and down ladder and along platforms to collect letters in the correct order avoiding a rather interesting pig-like creature on a skateboard who'll steal your letters.

In *Scramble* all the letters are mixed up leaving the children to work out just what the original word is. *Corrections* I found particularly useful with some Year 2 children who need work on doubling ss and ll. Here they must look for incorrect spellings, find them and the Fing leaps into action to put it right, but watch out as Pog's on his skateboard again and to many bumps means your Fing will be taken off on a stretcher.

Finally *Magnets* asks you to find words hidden within words. All set on a railway track with you using the Fings to isolate words within words, magnetise them out of the way and then watch as one Fing parachutes away and another whistles up another train of words.

You could just jump straight into this program and used the prepared lists. However, you'll get even more from it if you create your own lists using words being used in class. It may take a little time, but it's worth it.

The separate Editor allows you to change any of the 21 lists provided as well as compile your own. I found it useful to alter one of lists for Corrections so that it contained the common spelling mistakes for a specific group. You have access to a dictionary with search features which allows you to search for text strings at the beginning, end and within words.

I liked *I Can Spell* as it was so easy to set up (it comes with the nice Primary font too) and the children enjoyed working with the animated Fings. Some of the controls are not that intuitive but the manual is good and my only real concern is the sound. This is not quite as clear as I'd like. Using synthesised rather than sampled speech does mean that every word can be said but sometimes – especially in *Scramble* what you're looking for can be hard to make out.

END

Product details

Product:	I Can Spell
Supplier:	RESOURCE
Address:	51 High Street, Kegworth, Derby DE74 2DA
Tel:	01509 672222
Fax:	01509 672267
Ages:	5+
Price:	£30
Web:	www.resourcekt.co.uk
E-mail:	info@resource.co.uk

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Harmonic Control

Part 1 of Mike Cook's 'aural exciter' project

Sound modifying circuits, or effects units, come in many shapes and sizes, this month's project looks at a unique design that can certainly add that extra something to the sound of an instrument or voice.

Perhaps one of the first guitar effects was the 'fuzz box', it was staggeringly simple and consisted of a pair of diodes that clipped or suppressed the top and bottom of a waveform. This made the sound 'dirty', a much desired effect among the heavy metal rocking fraternity. However, what you really do when you alter or distort a waveform is to add in harmonics.

Any shape of waveform can be made from a number of simple sine waves, each waveform or harmonic an integer multiple of the fundamental or lowest frequency. The quantity and number of harmonics determines the type or timbre of the sound you hear. For example a flute is almost a pure sine wave, whereas a Church organ has lots of harmonics in its waveform.

In real instruments the harmonic content usually varies throughout the duration of the note, giving a sound it's unique quality. Some instruments vary more than others, that's why a Church organ, who's harmonic content doesn't change over the duration of the note, can never sound like a plucked guitar string, but *can* sound like a bright trumpet.

The simple fuzz box adds odd-harmonics, that is extra notes of a fundamental frequency multiplied by an odd number. In general odd-harmonics in a note make it sound hard and metallic. In contrast, even-harmonics sound warm and mellow.

Incidentally that's why some people profess to prefer valve amplifiers over transistor ones. The design of these mean that valve amplifiers are prone to even harmonic distortion where as transistor amplifiers are prone to odd-harmonic distortion. Another point to note is that adding odd-harmonics give the waveform symmetrical distortion whereas even-harmonics make the waveform asymmetric.

Now wouldn't it be great if we could control the amount of harmonics in a waveform? In effect that's what the draw bars of an organ allow you to do, but how can you apply this to other instruments? To a certain extent you can do this with filters, but the harmonic has to be in the waveform to begin with. What is needed is a system of adding harmonics, in controlled quantities, to a waveform that might not contain them.

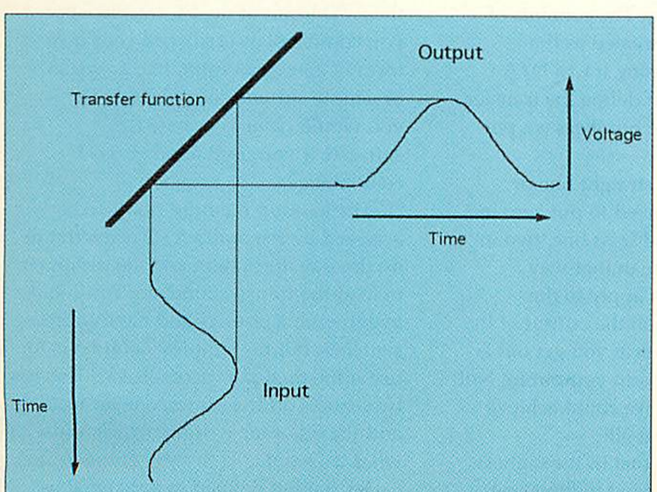


Fig I: Straight line transfer function reproduces the input on the output

Such systems go under trade names like 'aural exciter' and their operation is subject to great secrecy, however I have discovered how to do the same thing by using your computer and a handful of components.

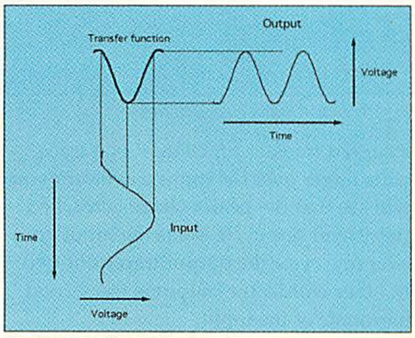


Fig II: Curved transfer function produces only second harmonic

The secret lies in what is called a transfer function. Any signal processing circuit has a transfer function. Take an amplifier, put a voltage on the input and a voltage appears on the output, if you draw a graph of the different output voltages for a series of input voltages you have drawn the amplifier's transfer function.

If you are designing a Hi-Fi amplifier you want this transfer function to look like a straight line, so that whatever signal shape you put in, you get the same shape out, see Figure I. It might be a bigger signal coming out but it is the same shape as the input. If your amplifier does this it is known as a linear amplifier.

So far so good, but what if the transfer function is not a straight line, in most practical circuits it is not quite straight but curves slightly. What happens then is that the output waveform distorts slightly at high levels, or in other words harmonics are added.

Now, this is the clever bit, if you can exactly specify the shape of the transfer function you can make it such that you get the system to produce any mix of harmonics you want. In Figure II we have

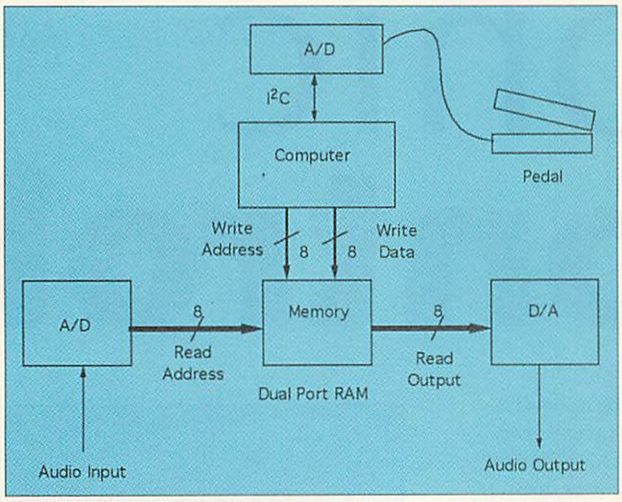


Fig III: Exciter pedal block diagram

a curved transfer function, if you trace your finger over the input waveform you will see that the peak voltage is reached twice over one cycle, so as the input goes over one cycle the output traces out two. In other words, the output is the second harmonic of the input.

In general you can have any mix of harmonics, if you want a waveform that consists of equal parts of the fundamental and say, the fourth harmonic, you can calculate a transfer function to do this. This is a lot easier than it might sound if we break the task up into parts. A mathematical function can be defined for the transfer function that produces any one harmonic, given a fundamental frequency.

As the harmonics get higher so the function has more terms in it, these are called Chebyshev functions and are shown in Table I. You will see the T_1, or transform for the first harmonic or fundamental, is a straight line graph and T_2 is a cubic equation. The X refers to any input voltage, so the left hand side of these expressions is the amplitude or Y value of the output. To make matters simpler you can normalise this, that is make it range between +1 and -1.

Chebyshev Polynomial

When the transfer function is Tk(X) and a cosine wave with amplitude 1 is applied to the input then the output contains only the kth harmonic.

$T_{K+1}(X) = 2XT_K(X) - T_{k-1}(X)$

$T_0(X)=1$

$T_1(X)=X$

$T_2(X)=2X_2 - 1$

$T_3(X)=4X_3 - 3X$

$T_4(X)=8X_4 - 8X_2 + 1$

$T_5(X)=16X_5 - 20X_3 + 5X$

$T_6(X)=32X_6 - 48X_4 + 18X_2 - 1$

$T_7(X)=64X_7 - 112X_5 + 56X_3 - 7X$

$T_8(X)=128X_8 - 256X_6 + 160X_4 -32X_2 +1$

Table I: Chebyshev functions

To produce a mix of harmonics you simply multiply each function by the fraction of the harmonic you want. For example, to produce a transform function that produces a mix with three quarters of the second harmonic and one quarter of the third, multiply T_2 by 0.75 and T_3 by 0.25 and add the two together.

It's one thing defining a transfer function and another implementing it, what we need is a circuit where we can define what voltage comes out for every possible voltage input. Well, there has been one of these built into every Acorn computer, even the original Model B (or should that be Model A?).

However, this was not used for sound but for video, it was a palette or look-up table, and we can make a sound version in the same way. First of all we need to digitise the sound with an A/D converter and turn it into a stream of numbers, each number represents an instantaneous voltage.

Then apply these numbers to the address lines of some memory so that each number or input value has it's own address in the memory. The contents of that address are then treated as the output voltage by passing it to a D/A converter. We can then define the transfer function simply by the numbers we put in the memory.

For example, for a straight line or linear transform you need to put zero in address zero, one in address one, two in address two and so on, in that way whatever number you apply to the address lines you get on the output of the memory, so the waveform you get out is the same as the waveform you put in. Not very exciting because we could achieve this with no circuitry at all!

However, imagine that in the highest address you put zero, next highest one, second next highest two and so on, you will have a linear transfer function with a negative slope, so any waveform you put in will produce an inverted waveform on the output, another way of saying this is having a phase shift of 180°.

Because the ear is not sensitive to the phase of a waveform (despite what hi-fi buffs will try to tell you) this again is not very exciting. So let's try to imagine something we can hear, fill the memory so that addresses zero and one contain zero, addresses two and three contain one, addresses four and five contain two and so on.

Now when you apply a signal you will get an output signal that is the same shape, but half the amplitude of the one you put in. You can see that the transfer function is a straight line with a 22.5° slope, in fact the slope of this function defines how much attenuation we have.

By programming different slopes of transfer function we can set the output volume to anything we want, we have created a programmable volume control.

This is interesting but not unique and there are better ways of achieving the same result. However, remembering the first part of the article we could program the memory to contain a curved transfer function, then the output waveform would be a distorted function of the input waveform and that distortion would contain the harmonics we require. As a further refinement this transfer function can be changed, using some user input like a foot pedal, so the harmonic content at any time can be instantly varied.

Figure III shows the block diagram of the circuit we need to use to achieve this. A foot peddle is used to control which one of a number of pre-calculated transform functions are loaded into the look-up memory. This is connected to the A/D input of my I²C interface board, you could just as easily use your own form of analogue input, like a joystick or simple volume control knob, but you would have to change the software if you used another A/D converter.

The look-up memory needs to be accessed by the audio A/D converter to do the transformation and the computer to load the transfer function. You could assign each a priority and have address switches, but the simplest solution is to use some dual port access RAM. This has two sets of address lines, one for reading and the other for writing, which is just what we want.

So, having defined exactly what we need, tune in next month for the full circuit diagram and software to drive this project.

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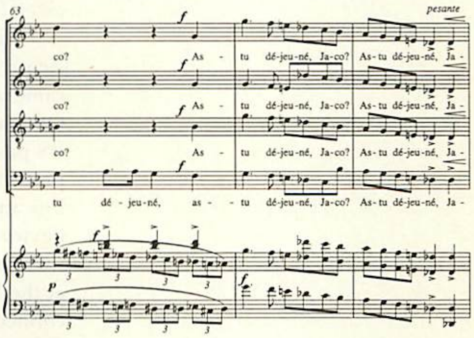
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Rambles through Acorn Wood

Mike Cook digs up some more fungi

Another bulging post bag, so no time to pontificate this month, on with finding the wood among the trees. First off Tim from Ringwood School, Hants wants to extend his network computer (NC):

'Like many schools we have a number of Acorn NCs, we have just ordered a digital camera which will connect to a standard RISC OS machine via the serial port. Do you know if it's possible or would it make a good magazine project to construct a 'black box' which has IR bits and serial port. Connect a standard serial device to the box and point it at the NC.

'Presumably it would need software at the NC end, ideally to fake the IR connection as standard serial data (whatever user software is used it believes it's using the standard serial port). I assume the NC has IR output as there are a couple of LEDs on the front panel with no other obvious function.

'Obviously this needs access to an NC and documentation? What do you think? Too tricky, too few NC users? I feel not, with all the Matrix stuff / Sprinter and so on – actually it sounds like the basis of a possible commercial product?'

Yes it sounds like that to me, the problem is that I don't have a network computer nor a digital camera to develop it on, if I had to buy one just for the project I couldn't even begin to recoup the money from the article fees.

If the Network Computer does have an IR interface it is likely to be an IrDA standard. This is very close to a standard serial port in terms of signals, the only difference is that the space signal consists of the LED being on for only the central third of the data period.

The default rate is 9600 baud and it is relatively easy to make a converter to and from the standard serial signal. However, if the camera won't play at that speed, and I think it is a bit slow for transferring images, then you could be struggling.

The IrDA standard does allow for faster speed by negotiation but you would have to

Noisy Risc PC

S.I.Evans from Bangor University is full of praise for our favourite computer:

'I have now invested in a StrongARM Risc PC. It is such a wonderful machine, that it makes me cringe every time I have to use the College network of PC's. However, I am having a few problems, very simple ones I do add.

'My Risc PC is making quite a bit of noise as it is running. I have tried to inspect what it is, but couldn't work out what the problem is (I don't think it's the fan). It does sound quite similar to a fridge, and even though I am starting to get used to it, it would be nice to be able to type my essays in peace.

'I am also having problems with *Quake*. I have *ArcQuake6* and have tried to get the PAK files of a *Quake* Demo, to make sure that it works before going to by the full game. But I haven't been able to locate the PAK files from the game. I was wondering if the problem was caused by the fact that it was from a PC version of a CD, or could it be because it had been compressed? I was wondering therefore if the same problem would occur on the full game?

'Finally, I was wondering, since I am in college and have to move backwards and forwards quite a while, if you could give me some advice about how best to look after the computer while on my journey?'

If it's noisy then it can only be from something moving. The only things that move are the fan and the hard disc. You can check this by specifying a spindown time for the hard drive in the *!Boot* settings. Then you can see if it goes away. Some drives are noisy, I know my extra SCSI drive is much noisier than the original drive.

You could even try disconnecting the hard drive (when powered off) as unlike a PC it will work without it. If it is the drive I am not sure of a cure, you could try fixing some felt underneath the fixings or propping up the computer box on something sound absorbing. There are no air vents under the box so that should be OK. If you have the original yellow plastic thingies that go in the floppy drive then use those when transporting your computer, also make sure that you shut down the computer before turning it off as this will park the drive. As to the game sorry I don't know, you could try a call to games@acornuser.com they might know.

handle that externally, possibly with a PIC system. Sounds interesting though, anyone want to pick up this one?

Rob Ward from a land down-under is having just a spot of bother with my oscilloscope:

'I have finally got my Real Time oscilloscope (*Acorn User* July 1998) built after hanging onto the chips for a couple of months. It appears to have a problem in that it only registers the positive half of the waveform. I have added a graphic of the screen below.

'The input was the just the 50Hz hum produced by hanging onto the positive input lead. The negative input lead was clipped to the earth side of the circuit. Later I biased the negative input lead to about .85 volts using a 47k/10k divider and it appeared to make no difference. Isolating the input lead with a O.1uF capacitor to reduce any chance of leakage pulling the input down also had no effect. Could it be a software problem?

'I have checked the hardware over and over. Could I have blown the ADC chip? I am a teacher and I am looking forward to be able to incorporate diagnostic CRO screen dumps in my Electronics notes for my middle school classes. Many thanks, and believe me, your work is the main reason that I have kept buying *Acorn User*.

'Your articles are so far ahead of any PC magazine where the technical challenges are about at the level of plugging a printer cable. They inspired my Robotics page, at http://www.mtclearsc.vic.edu.au/Robotics/Robots.htm'

OK flattery will get you most places, I did take a sneaky peek at your Web site and I was most impressed, well laid-out with excellent quality pictures. It details projects suitable for secondary school students and is well worth a look.

Anyway down to your problem, in order to display some pickup you must earth the -ve input. Then you want to bias the +ve input to halfway with a couple of high value resistor to +5 and earth. I would start off by using 1M. Then the displayed waveform should sit at halfway and an AC signal will pull it up and down.

If you are using a signal generator you might have to have a capacitor coupled input if the earth is the same as 0 volts. The thing to remember is that the A/D converts the input voltage into a number, however that is only a number for positive voltages, it will not give you anything for negative voltages.

Therefore to display a waveform that goes negative you need to put some positive bias onto the input so the waveform can take it off.

By the magic of the Internet feedback was swift:

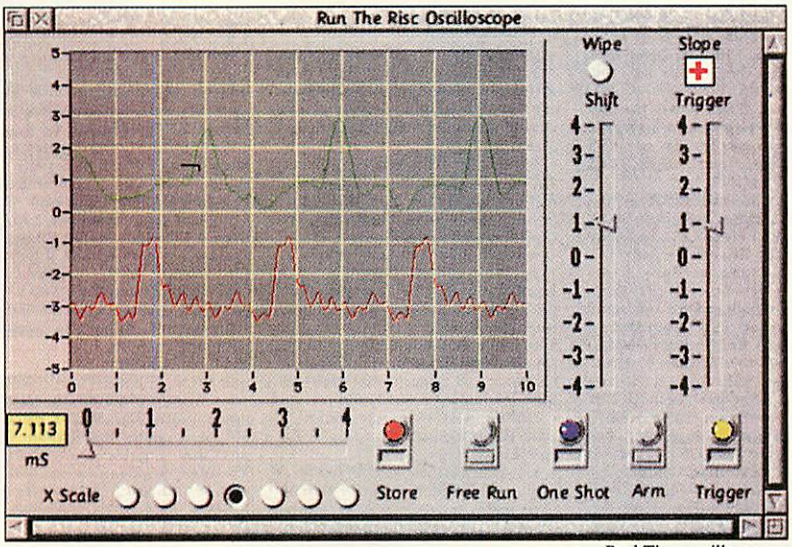
'Thanks for the advice below. I put the -ve to earth and used a pair of 1 Meg ohm resistors to provide a central bias towards the 2.5v range for the +ve input of the ADC. The hum waveform now has upper and lower symmetry. Very nice.

'I am going to let my brother know straightaway that I can now analyse circuits and get the graphics for it very quickly. He should be impressed (he is a Mac owner, but a tolerant one) I have tried it on an astable multivibrator and it looks really good. The signal is clean and appears to render the waveform excellently. I am impressed.

'Our Web site should go ahead in leaps and bounds. Would it be easy (relatively?) to add a sprite capture routine to grab 'screen scope' sprite images?'

It shouldn't be two difficult to add a screen grab but why bother when Paint can do it for you, that way you can decide if you want just the waveforms or all the controls as well.

END



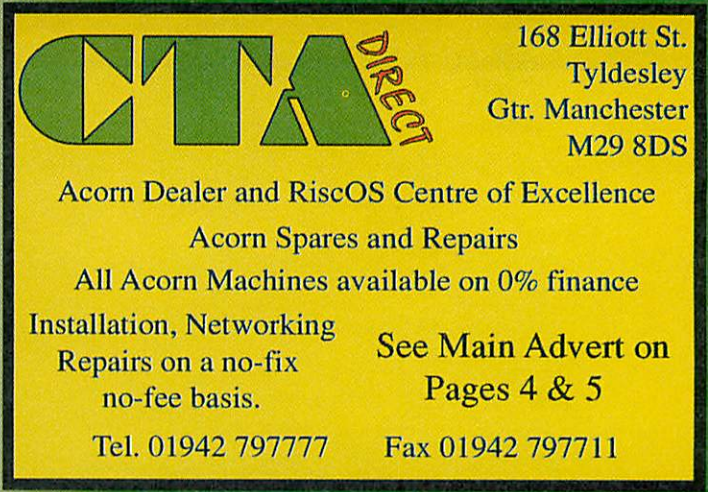
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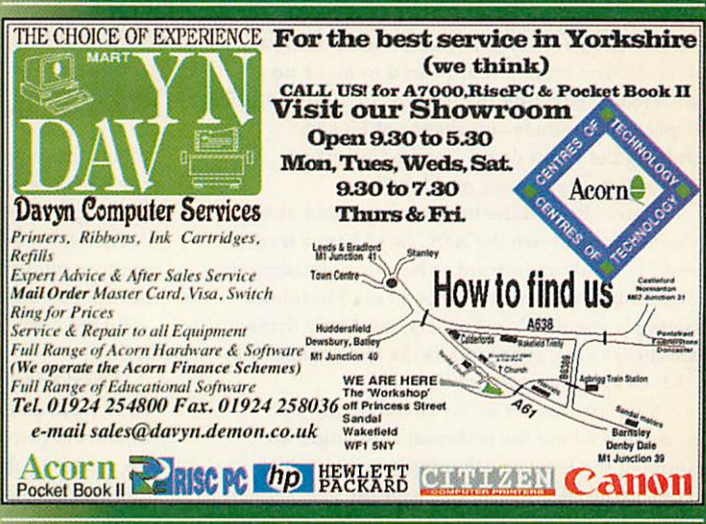
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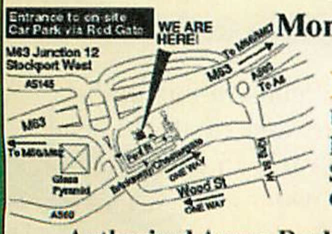
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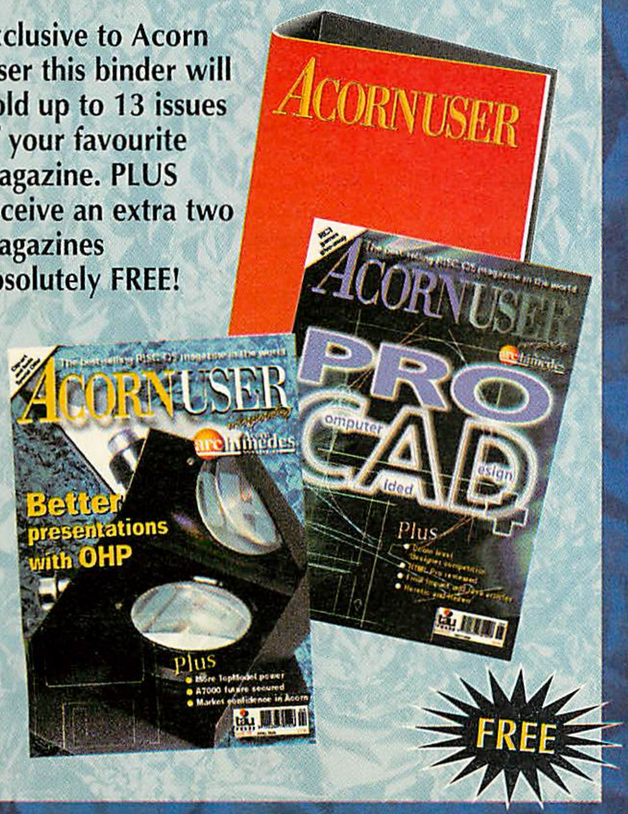
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Is all as it seems?

Having spoken to many prominent figures at the Wakefield show, I have unearthed some rather unsavoury facts about our knights in shining armour, RISCOS Ltd. According to my sources, all registered dealers/developers must sign a rather draconian contract before being allowed to have a sneak preview of the upgrade, or sell it on to end users.

Two particular examples which I would like to draw readers' attention to read as follows:

1) We agree not to disagree with RISCOS Ltd in public.
2) If we are to sell products for other platforms, we agree to allow the RISC OS version precedence in advertising and other marketing material.

I assume this refers to situations such as *Sibelius* and possibly Cerilica *Vantage*. It is worth pointing out that those not agreeing to this contract are not allowed to distribute/develop for the new OS. It's quite simple: no contract, no upgrade.

I for one cannot understand why the powers that be at RISCOS Ltd feel so insecure that they must bully developers into not criticising their product, or way of doing things. Okay, so they might be wanting to promote unity in the Acorn platform, but surely big brother tactics such as these will only promote bad feeling and anguish?

Perhaps someone at RISCOS Ltd would care to issue a statement on these matters, because they should be of grave concern to every user who is thinking about purchasing the upgrade. I hope RISCOS Ltd won't want us end-users to sign a similar contract to make us all into pro-RISC OS drones!

Don't get me wrong, RISCOS Ltd are doing a great job and I really enjoyed the article by Alastair Bailey in your June issue, but perhaps the ethos of the company itself needs to come under some independent media scrutiny too.

Brendan Bowler by e-mail

Paul Middleton, RISCOS Ltd MD replies: *I suppose it is a problem with the English language that anything written can be interpreted in many different ways, and discussing anything with secondhand knowledge can either make an interesting parlour game or lead to panic in the streets.*

In this instance I believe that some deliberate slanting of the facts has been applied by some who would like to see RISCOS Ltd fail in order to further their own ambitions.

Mr Bowler has clearly been seduced by the Dark Side and if he had contacted me directly at the show, as a number of people did concerning this same matter, I could have set the record straight there and then.

Firstly Registered Developers are requested to sign two documents.

1) A Non-Disclosure Agreement, which is absolutely standard and is legally binding, and without which the company or individual cannot become a Registered Developer.

2) A Code of Conduct, which is not a legal document, but expresses the standard of behaviour that we hope that Developers will want to agree to, in the general operation of their businesses. It is not mandatory to sign the Code of Conduct as we cannot legally dictate terms of employment for a company.

*We are also **not** forcing people to sign a draconian contract before allowing them to become a Developer, or a retailer of RISC OS upgrades to end users.*

As regards the two particular examples quoted:

1) *The Code of Conduct actually requests that: 'The Developer agrees not to publicly criticise the actions or inactions of RISCOS Ltd in public forums…' This is only normal courtesy. If you have a problem with a company or their service you take it up with the company concerned. You don't complain to a magazine first, before contacting the company concerned, to check that you are not complaining about something that is untrue.*
2) *The Code of Conduct requests that: 'The Developer agrees not to indulge in any form of anti-competitive actions which might jeopardise the growth/development of the RISC OS marketplace. In particular the Developer agrees not to misrepresent to a customer, or potential customer, the consequences of using their products in preference to those of another Developer. The Developer also agrees not to actively promote software which runs under any Operating System other than RISC OS when suitable software is available for RISC OS.'*

Mr Bowler then goes on to state that 'those not agreeing to the contract are not allowed to distribute/develop for the new OS. It's quite simple: no contract, no upgrade.'

This is definitely not the case.

*Firstly we have different contracts for Developers, Dealers and Installers. Developers **must** sign the NDA, otherwise we will not be able to provide them with any Technical Support – this is completely normal in any business of this sort. The Code of Conduct is, however, just that, a Code to which we hope people will want to adhere but it is optional.*

*However, I must point out that it is **not** a pre-requisite to become a Registered Developer in order to develop and sell RISC OS-based software. We have no wish to stop people developing software but we can only actively support those that want the work with us, rather than those that want to work against us.*

We have no intention of making end users become pro-RISC OS drones by making them

sign contracts, or any other means. The policy of RISCOS Ltd is to enable all types of operating systems to co-exist, by working to provide direct connectivity with Windows, Linux, Macintosh and other systems, rather than having the closed system that is Windows, for example.

Perhaps, however, it is the motives of some of those 'prominent figures', Mr Bowler spoke to at Wakefield that need to come under media scrutiny – or perhaps they should stop dealing in hearsay too.

RISCOS Ltd was set up solely to allow the 200 plus companies that formed the 'Acorn Community' to carry on with their businesses once Acorn had decided to leave the market. There are however, signs that some companies would prefer it if they were left in a monopoly situation, with regards to supply of particular products.

Mr Bowler, based on hearsay evidence, appears to be advocating that people think very hard before considering purchasing RISC OS upgrades in case we are trying to become 'Big Brother'. This is very much falling in line with those who want to see monopoly suppliers, rather than encouraging everyone to go out and upgrade to RISC OS 4. Why not get behind RISCOS Ltd, whose avowed aim is to support the entire RISC OS community?

Goatly wisdom

In reply to Simon Morgan's letter in the June issue of *Acorn User*, I'm not sure I can be much help with your problems, but I thought you might be consoled to learn that you're not alone with the 'disc not formatted' error. I've been getting this on and off now for a few months; sometimes a reset cures it and sometimes not. I replaced the floppy drive (luckily not very expensive) but without benefit other than quieter track-seeking.

I recently had a 1.6Mb floppy (quite old, that had been down the back of a radiator for a couple of years!) that my Risc PC simply would not access, yet my A5000 catalogued it quite happily. Again fortunately, there was nothing of value on it (and the contents would have been rescuable if necessary via the A5000), but I'm not at all sure what was going on.

My only theory is that there might have been a slight misalignment of the drive head(s) on the old drive, but that doesn't explain why some of the problems can be cured by a reset. Personally I blame the scapegoat.

Bruce Goatly, Wimbledon, London

Great ideas

RISC OS might be surviving as a very small collection of niche markets (the Wakefield show was evidence of that), but obviously the Holy Grail is new users. Seeing as the popular complaint against Acorn was its complete lack of marketing ideas, now is the chance to offer realistic solutions. These are a few I came up with:

- An exhibition fund. If possible, a fund should be set up allowing developers a chance to be part of a stylish RISC OS village which could be present at relevant non-Acorn Computer shows (or even non-computer shows!). There should be stylish stand graphics, and plenty of machines demonstrating clearly the differences between RISC OS machines and the standard fare.
- The return of open days. There always used to be periodic 'open days' in my home town of Taunton. These seemed to attract plenty of non-Acorn people. I'm sure Gordon Taylor was responsible for shifting many, many Acorn machines with his demonstrations of Computer Concepts products at the Taunton open-days. Perhaps Cerilica could do the same in 1999 and onwards. Maybe MicroDigital's efforts to sell Mico as the ultimate home-computer would benefit from the creation of a series of locally advertised Open Days.
- The voucher scheme. Over the nine or so years I've used RISC OS machines at least five people have bought them as a direct result of seeing mine in action. I'm sure many people came to RISC OS machines by seeing a friend's or family member's machine. To encourage people to become RISC OS evangelists, a voucher scheme could help to promote this process, offering those ordinary users responsible for creating new RISC OS users cash-back.

What do other people think could realistically sell RISC OS machines and expand the market?

David Charles Hammonds

I first saw this line of thought on the Acorn newsgroups and asked David to put his ideas into a letter for the magazine. All three sound like excellent suggestions, and personally I'd love to see a stand of the top RISC OS products at a PC show. What better way to directly influence PC users and show the world the benefits of RISC OS and it's associated software.

With RISCOS Ltd now on the scene and pushing a 'let's all work together' message, and with the release of so many excellent products it would seem a prudent time to go on the attack. The ideal time would probably be when RISC OS goes hardware independent, but why wait that long, it can't hurt to let people see what we all use at this moment.

Or can it?

After a chat with Cerilica about their thoughts on the matter, Nick van der Walle made a rather good point. If we were to go to a large PC event to show off our wares, and people where to say 'hey, that's some kind of program you got there buddy. I'll take it. Now where can I buy one of those machines?'

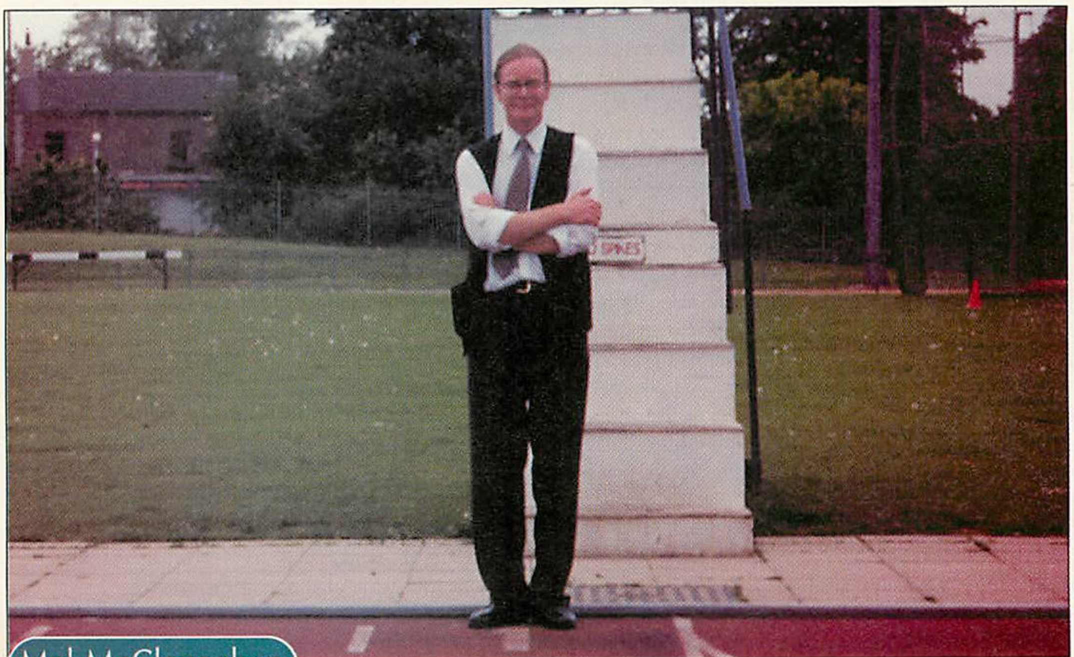
What are we going to say?

'I'm sorry, but you can't buy a StrongARM machine at the moment'? – we can't market software without a machine to run it on.

So, it would seem we have to wait for suitable hardware to become available before we take that step into the very different world of PC marketing. I'd love to hear your comments and ideas on the matter, and not just from end users, if developers and dealers want to comment then feel free. END

Contacting us

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Mal McClenaghan

> Roy has drawn a line in the sand... everything has to be this good

Some Regan Files are more pre-planned than others. This month's came about when I was chatting to Graham Simpson on the Simtec stand at the Wakefield show, and he asked me if I'd like to 'meet an Australian'. Always up for new experiences, I agreed, and the Australian in question turned out to be Mal McClenaghan, product manager for The Image Factory, Victoria, Australia.

'I'm here on a working holiday,' Mal claims. 'I haven't had a holiday for five years. It doesn't sound right for an Australian to be coming to England for a holiday. I came on a buying trip, because I wanted to be able to bring in products to the Australian market.

'Currently, when people walk in the door and decide to buy a Risc PC because we have just demonstrated one, we can't actually sell them one there and then, because it will take me several days to get one. But we want to have the whole shop stocked, we want to be able to say to people: "Here is the machine you want to buy, take it out the door." This has always been a problem for Australian dealers. We can get stock quicker from England than from Western Australia.'

So far he's doing well. Mal had only been at the show for a few hours and had already picked up three new suppliers. His major coup was getting the Australia and New Zealand rights for the RiscStation, the new machine developed by Roy Heslop of CTA.

'One of the problems about being an Australian dealer is that it is very difficult to pick up any gossip,' jokes Mal. 'Gavin from Simtec told me it would be good if I could come to Wakefield but he could not tell me why. I have now met Roy, and know why. The RiscStation has an excellent chance of succeeding in Australia. It is beautifully designed, the pricing is right and the specs are right too.

'We will be doing the manufacturing. We will import motherboards and make them ourselves, although we have to make sure our AMC regs for our testing is going to cover us for assembly. This means if Roy sells it at a certain price, our price will be the same.

'There will be none of the familiar: "I see this in *Acorn User* at a certain price and it is much more expensive in Australia." This is going to even things out a lot regarding supply and support; it is these matters which have worried people a lot in Australia.

'I guess the important thing for the market as a whole is to have room for multiple machine manufacturers. No one is going to be sole provider, so it encourages competition and it is going to bring prices down. The people who benefit are the people who are going to buy. Roy has essentially drawn a line in the sand and has said: "This is the new entry level and everything has to be at least this good."'

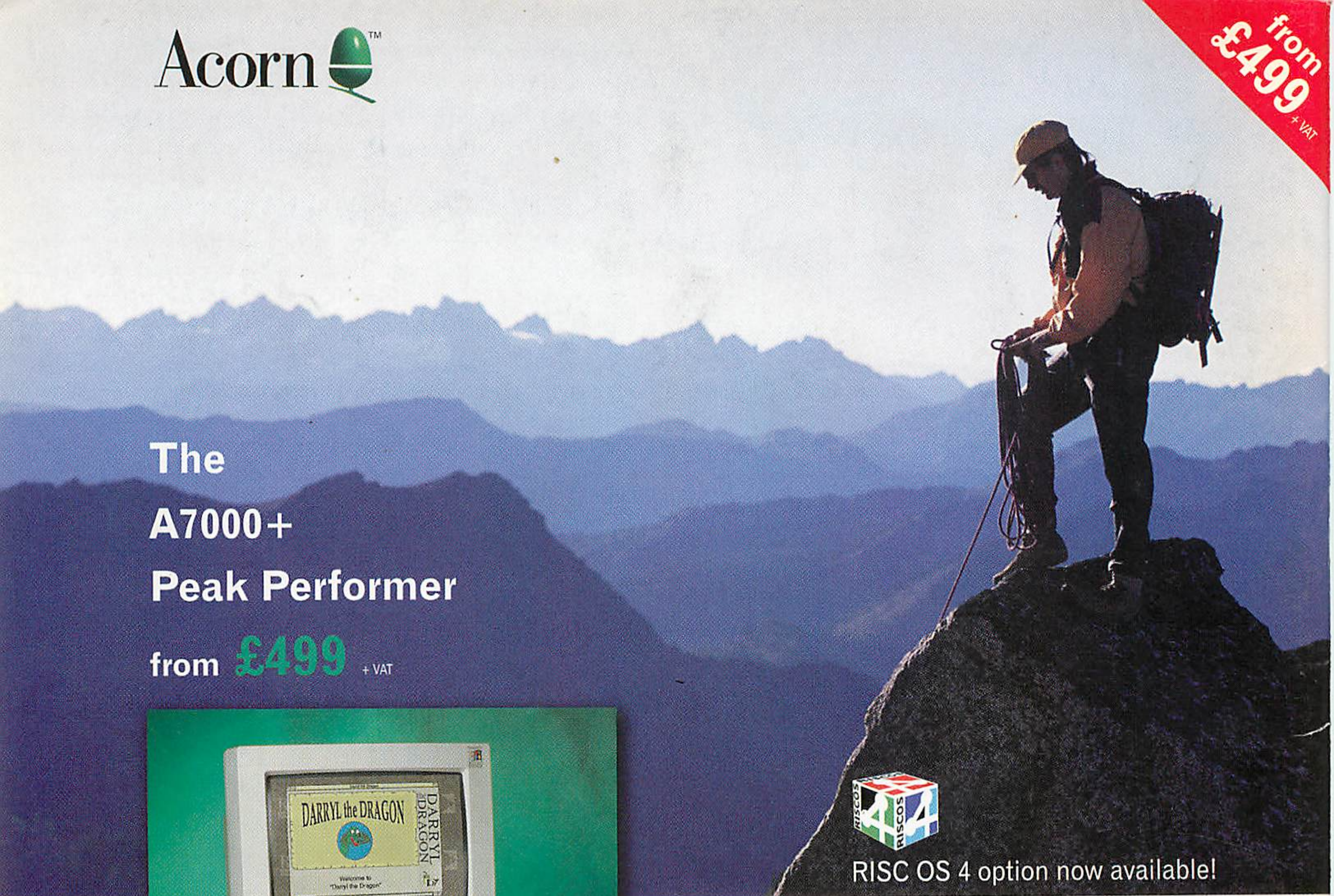
One very important person to Mal is his wife Marisa: 'She has been supportive right from the start,' says Mal. 'When we first got married she knew very little about computers and was only answering the telephone; now she gives diagnostics.

'She is very spirited: if I moan about a supplier she tells me not to moan and do something about it, if I am down in the dumps she says "Yes, yes, yes," and pats me on the head, if I am down in the dumps for a second day she tells me to pull myself out of it and do something about it. When I suggested to her I should come to the show, Marisa said that I had better or someone else would seize the moment and they would mess it up.'

Mal has just won Australian achiever award for excellence in customer service in the area of Internet services and computer buyer. The award is run by an independent group who take nominations for the award. They are given a list of three of the company's customers and one supplier for them to contact and rate the company.

'I am passionate about the RISC operating system' enthuses Mal. 'People have to realise that the Acorn market is not a cash cow to be bled extremely dry. In Australia it is my mission to expose the RiscStation to a much larger community than the Acorn ever was.'

Jill Regan





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